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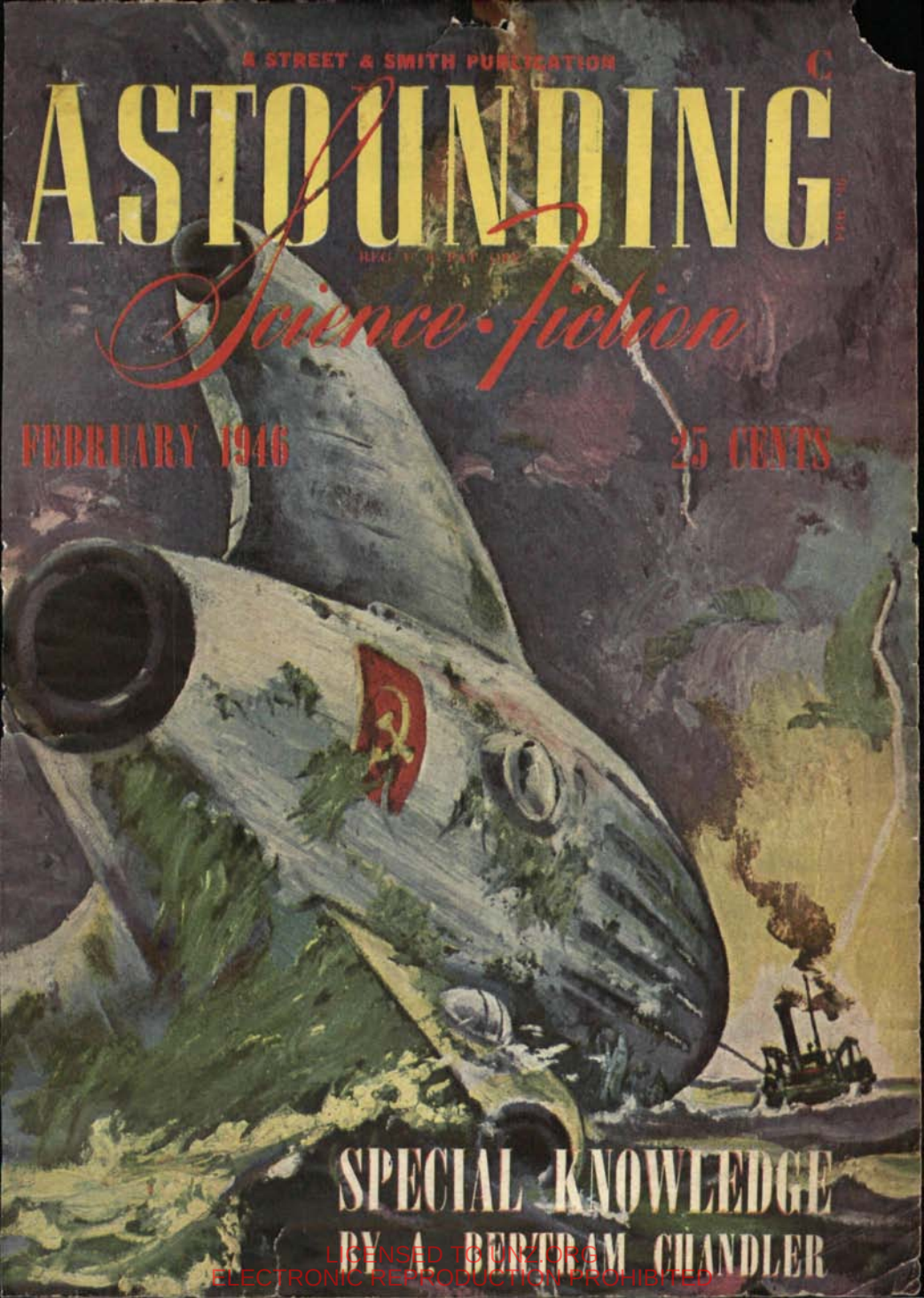

SPECIAL KNOWLEDGE

BY A. BERTRAM CHANDLER

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At the first sign of a Cold or Sore Throat

GARGLE LISTERINE ANTISEPTIC

YOU may help lessen a cold's severity or head it off entirely if you take this delightful precaution early and often, because . . .

Listerine Antiseptic kills *millions* of germs called the "secondary invaders" on mouth and throat surfaces before they can stage a mass invasion of throat tissues to produce a cold's miserable symptoms.

Attack the Germs

Ordinarily the secondary invaders cause no trouble. But they can often get the upper hand when body resistance is lowered by fatigue, wet or cold feet, drafts, and sudden temperature changes.

So we repeat: At the first symptom of trouble, gargle with Listerine Antiseptic. Attack the germs before they attack you.

Actual tests have shown germ reductions on mouth and throat surfaces ranging up to 96.7% fifteen minutes after a Listerine Antiseptic gargle, and up to 80% an hour after.

This marked germ-killing action, we believe, helps to explain Listerine Antiseptic's impressive test record in fighting colds.

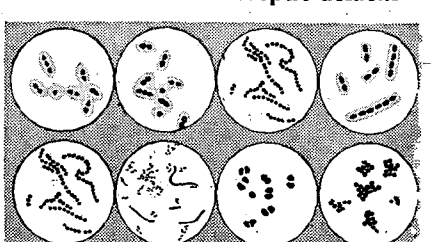
Fewer Colds for Listerine Antiseptic Users in Tests

Tests made over a period of twelve years showed this remarkable record:

That those who gargled Listerine Antisept twice daily had fewer colds and fewer so throats than those who did not gargle. Mor over, when Listerine Antiseptic users did ha colds, they were usually milder and of short duration.

LAMBERT PHARMACAL COMPANY, *St. Louis, M*

The threatening "Secondary Invaders" which Listerine Antiseptic attacks



TOP ROW, *left to right:* Pneumococcus Type III, Pneumococcus Type IV Streptococcus Viridans, Friedlander's Bacillus. BOTTOM ROW, left right: Streptococcus Hemolyticus, Bacillus Influenzae, Micrococcu Catarrhalis, Staphylococcus Aureus.

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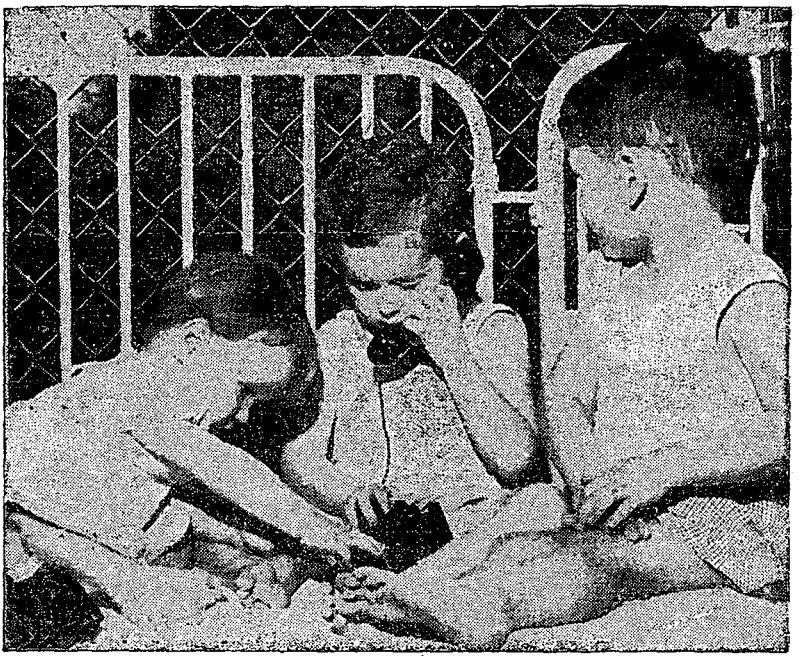

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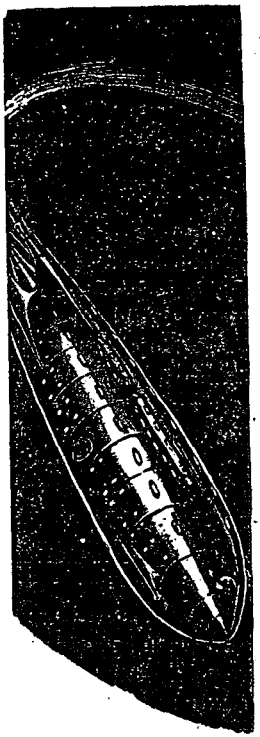

ASTOUNDING
SCIENCE FICTION

Reg. U. S. Pat. Off.

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Postwar Plans . . .

Humanity can make its postwar plans on two schemes of lifee; the choice is up to mankind. We merely propose the following suggestions as possible guides to the future:

PLAN FOR SURVIVAL

Studying the photographs of Hiroshima and Nagasaki, a number of pointers on design for postwar—and, of course, pre-next-war—homes can be gleaned.

The Hiroshima photographs show that atomic bombs, when exploded in air, create a blast wave capable of destroying almost any type of construction, but that reinforced concrete offers maximum resistance to collapse. The experience of Army and Navy forces attempting to destroy enemy works by bomb and shellfire have also shown that reinforced concrete, in considerable thicknesses, is astonishingly resistant to destruction, and offers the maximum protection to men on the other side.

Reinforced concrete, if not in the direct area of attack of an atomic bomb, gives a reasonable hope of survival. The area of attack of the Hiroshima and Nagasaki bombs was, of course, only two miles or so, but present developments have probably reached a ten-mile destructive radius. In planning to survive the overnight war of atomic bombs, allowance should be made for further improvements in annihilative techniques. The present trend of international hatreds, plotted against the probable rate of atomic advance in other countries,

PLAN FOR EXPANSION

The release of atomic energies under human control opens up a field of science and technology as great as, if not greater than the sum total of previously available investigation. With X ray, natural radioactives, cyclotrons and betatrons we have, in the past, nibbled at the most powerful citadel in the universe; the nucleus of the atom. We've broken into that citadel now, and the Intelligence Division is collecting data, records, and reports that have been hidden in there since Time began.

Most of Astounding's readers have, I suspect, read the Smyth report by now. If you haven't, there's no adequate excuse for a science-fictioneer skipping the most important document in all of human history—get it. If you have, you're familiar with the concept of binding energy. One factor not too clearly brought into focus by the Smyth Report—Dr. Smyth had other things to cover—is the rather incredible fact that *all atomic nuclei have practically the same diameter of* 10^{-12} *cms.* There is an attractive force operating at that distance of 10^{-12} cms that overwhelms the electrostatic repulsions. Somehow, that force also has the weird property of repelling uncharged neutrons; graphite atoms simply

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suggests a period of about three to five years before atomic war breaks out. Since we will, in all probability, be somewhat ahead of the rest of the world in atomic bomb techniques, it can be expected that a ten-mile destructive radius will be available to our enemies, but about a twenty-mile radius for us.

Nagasaki offers other clues; hills can, and do, deflect the blast wave, and block the atomic radiation. The location of the house will be of vital importance.

Ideally, of course, the house should be a reinforced concrete bungalow type, modern style structure—no second story to fall in and crush you—with windows of plastic sheets or shatterproof safety glass. Flying glass shards can decapitate one. And it should be located in a box canyon in an unpopulated region of the Rockies or Sierra Nevadas, or the Ozarks.

Of course, if you must work in a city, the house must be located at least twenty miles out, on the far side of a hill, well down from the crest where maximum protection can be secured when the city is annihilated. You yourself may be caught in the city, of course, but your family, if at home, will have a better chance of survival.

The primary danger to people so housed and so located will be from the efforts of defense forces to deflect the bomb from the city, and from badly-aimed projectiles. There is relatively little danger from the first source; we have nothing which can approach or impede a three-mile-a-second rocket bomb.

bounce them.

The binding energy force, whatever it is, is utterly strange to us—a fourth, and totally different type of force-field, neither gravitational, electric nor magnetic.

It should be remembered that a uranium pile, when in action, gives off escaping neutrons in stupendous volume. These neutrons cannot be constrained; cadmium, boron, and certain other materials will absorb them and protect personnel. But a hole left in that shielding will supply a beam of neutrons of incredible power. When many grams of uranium are being transmuted each day, the concentration of neutrons is necessarily high. It is a nuclear, not a chemical, reaction, but remember that for each transmuted U-238 atom, a neutron is required. The reaction is, essentially: U-235, in an atmosphere of neutrons, tends to fission releasing more neutrons into the atmosphere, and increasing the neutron vapor pressure. U-238 tends to absorb neutrons when in a neutron atmosphere, yielding successively neptunium and plutonium. The reaction will proceed at a rate releasing so many million kilowatts of energy, and producing so many grams of plutonium per day, when the neutron vapor pressure is so many tenths of an atmosphere. With a beam of neutrons representing a 0.1 atmosphere pressure, you can generate an ungodly amount of radiosilver, or cause massive secondary reactions that yield protons in enormous amounts. And—*you can learn!*

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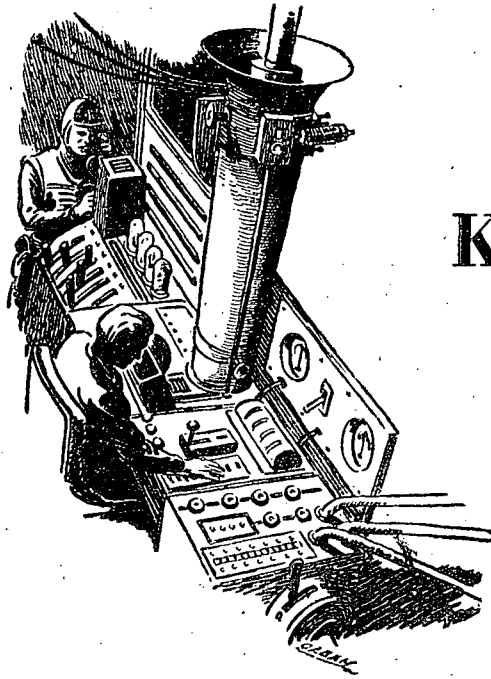
A good officer on a modern merchant marine ship has a great deal of highly specialized knowledge. But if that man somehow found himself an officer on a merchant spaceship, his special knowledge would seem pretty useless—ordinarily. But not that trip!



Special Knowledge

by A. BERTRAM CHANDLER

Illustrated by Orban

"Everything happens on my watch" thought Quentin Dale bitterly. If the converter had to give trouble he would far sooner it happened on his off-duty hours. Then he could go aft to give a hand. He was weak, he knew, on magnetronics—and feared that the Board's examiners would soon discover this when he sat for his Master Astronaut's certificate.

The Second Pilot slumped in his chair and gloomily, not without apprehension, regarded the power meters, whose needles seemed afflicted by St. Vitus' Dance. The Old Man would know what was wrong, he reflected. If he could see what the Old Man was doing about it he would learn far more than all the textbooks in creation could ever teach him. He— A sudden surge of power through the drivers cut short the train of his thoughts, forced him deep down into the thickly padded chair.

A groan made him turn his head. It was Chief Pilot Saunders. His cap was missing, and he looked more than usually untidy.

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"Ruddy nearly pulled my guts out, that one," he grumbled. "I wonder how the passengers are taking it—"

"What are you doing along here, Number One?"

"Far too many people in the engine room, Dale. The Old Man and the Commander are going at it hammer and tongs, can't agree on the cause of the trouble. Pawson and Jenkins are doing the fetching and carrying, and all the cadets are standing around with their big, ugly mouths wide open. I was in the way—so I came along here for a little peace and quiet." He eased himself into the other chair. "Ah, that's better." Then— "How is she going, Dale?"

"As per plotting machine," the Second Pilot waved his hand in the general direction of that instrument. "And the screens have nothing to report."

"Good. I'll take over. You'd better trot along aft and watch the great minds at work. It's high time you learned *something* about magnetronics! Go on! If you don't, I'll wander down to the lounge and try to get better acquainted with the fair Leonora!"

"Not bloody likely!" Dale was out of his seat in a flash. "Thanks a million, Number One! I'll remember you in my will!"

He rose to his feet—a little unsteadily, for the erratic, intermittent changes in acceleration were not conducive to equilibrium—and made his way to the—ladder?—*no, companionway, I think . . . after all, she* is *a passenger ship . . . better throw in a few fancy trimmings* . . . companionway giving access to . . .

"What was that, dear?"

"For the third *time, George, I wonder if we shall have a quiet night tonight?"*

. . . the body of the vessel. He . . .

"George!"

"Yes, honey?"

"Must you pound that blasted typewriter? You've only got a short leave—and you think more of your stories than you do of me!"

"I do not. But I must have something in hand for when we get back to New York. That's the worst of these short runs—too little time for writing. And all your pay off goes in Income Tax, Wine Bills and Superannuation. No stories, no silk stockings, Jane my dear."

"It wouldn't be so bad if you did sell something. Cameron said that your last effort stank."

"He said nothing of the kind. Anyway, I thought the love interest made the story. And I rather liked Natalya—"

"That was obvious. Rather like Natalie, wasn't she? I always suspected that you were sweet on her. Now I know."

"She was," said Whitley patiently —and carefully—"just a good boozing pal. Nothing else. She—"

A heavy explosion shook the house.

Windows rattled violently, but did not quite break. Flakes of plaster fell from the ceiling, some of them into the already clogged and dirty

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machinery of George Whitley's typewriter. From upstairs came the sound of a child crying. Jane rose quickly from her seat by the fire and hurried out of the room. Whitley heard her feet on the stairs, swift yet light.

He sighed, got up and went to the mantelpiece for a pipe cleaner. He began, halfheartedly at first and then with increasing enthusiasm, to poke among the springs and levers of his ancient portable, among a dozen varieties of highly unsuitable lubricating oil and specimens of dust from the atmospheres of half the seaports of the world. He didn't mind the dust, it acted as a silencer of sorts. But great hunks of ceiling were another matter.

The door opened silently.

"It's all right," said Jane. "The beastly thing didn't wake her up properly. I wonder where it was?"

"Sounded Hampstead way to me. But we heard it, that's the main thing. It's the ones you don't hear—"

"I know, I know. And now you'll tell me that they aren't really weapons at all, but the first spaceships, and that Ley says that a man could go up three hundred miles in one. It's bad enough having you spending your leave hammering away at your old typewriter without your going into frenzies of admiration for these horrible V weapons." Her voice changed. "But can't you remember, George? Can't *you remember? If only you could. It would be a shield over London—over England!"*

"I've tried, my dear." The face he turned to his wife was suddenly drawn and strained. "You know I've tried. And they tried up at the Admiralty, too. In any other country I'd have had a really rough time—not that it wasn't bad enough here. All that they know, and all that I know, is that I made some kind of disintegrating ray out of bits and pieces—and wiped out a bomber squadron. If only Quentin Dale had had the savvy to put it down in writing!"

Jane ran her hand through her red hair.

"But he didn't," she said practically. A vertical furrow appeared between her brows. "But the others?"

"None of them even saw the thing—though they saw it working. They're all back to normal, now, by the way. All except young Watkins. He's still trying to get his release so that he can become a Commando!"

Jane persisted.

"But suppose you are dreaming of him again—Quentin Dale, I mean. Dreaming that you are *him—and you get a sudden shock, as you did before. Wouldn't—?"*

"No go, honey. I don't pretend to know yet if Dale was only something dredged up from my own subconscious, or if he did really come back in Time. But his world is dead—and he is dead. Or, at any rate, it is no longer on the main stream of probability—"

"How do you know?"

"I don't know—*it's all a matter of feeling. But I carried on with* my *dream whilst* he *was raising hell*

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in my place. He . . . I . . . was captured by the Aryans. Alive. And they tried to make me talk. If I'd known the things they wanted of me, I would *have talked." He buried his face in his hands. "It was too bad to tell anybody—even you, my darling. And then everything sort of faded out, and I was in a dim, gray Limbo till I was called back. And I've never been able to write about Quentin Dale and his world since—"*

"But this—" Jane picked up one of the typewritten sheets. "Quentin Dale!"

"Not the *Quentin Dale.* He *was first cousin to the Gray Lensman. This is Quentin Dale II—strange, how I can't get away from that name—and he is Second Pilot of* Martian Maid *and lives in a vaguely communistic, peaceful World State. Rather a useless young puppy, too—"*

"But perhaps he *knows something."*

"Not him!"

Whilst she was talking, Jane was laying the table for supper. Absently, George Whitley watched her movements. It was the kind of scene all too familiar to the man ashore—but something for the sailor to store in his memory against long, lonely middle-watches. Then—

"Here!" he demanded, "what's the big idea?"

Jane colored.

"It was unintentional, George, I assure you. In any case, it's all we have. Unless you care to run round the corner for some fish and chips—"

"Too late—and too lazy. This'll do me."

He opened one of the bottles of beer on the table, filled Jane's glass and his own. Their glasses met, their eyes met, over the frugal meal of nightmare-inducing bread and cheese and pickles.

"Here's to my dream," toasted Whitley gallantly. "And here's to my dreams!"

"Here's to your dreams!" responded Jane.

It may have been a distant explosion that woke Jane, it may have been the strenuous efforts of her digestion to cope with the indigestible meal. In all probability it was her husband. He was twitching like a dog hunting dream rabbits, and he was talking softly but distinctly.

"Look at the meters!" he said as though to himself. "Look at the meters!" A long pause, then—"What are you doing here, Number One? As per plotting machine—And the screens have nothing to report. Not bloody likely! Thanks a million, Number One! I'll remember you in my will!" His legs started to work and the bedclothes began to slide over the end of the bed. "Good evening, Miss Starr . . . Strange how I always get the feeling that I've known her before somewhere . . . somewhen . . . *No, I don't know what the trouble is; I've just come down from Control. Yes, I'll let you have the dope as soon as I can. Cheerio for now." Another long pause. "Hey! What's*

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the rush? Where are you all going? I'm going in—"

The V-2 landed at the bottom of the road. For those at the end of its trajectory there was swift and sudden extinction. For those to whom distance lent a certain safety, but who were within the radius of blast, there was a brief but devastating fury of broken glass, fallen ceilings and flying debris.

In the next bedroom the infant Patricia set up a howl of sheer terror. Jane snatched up the emergency torch beside the bed, made to rush to the side of her child. She paused. Something was wrong, terribly wrong. Sailorwise, George invariably awoke on occasions such as these with all his wits about him. But now—

Jane shone the torch full in his face.

Then, for the first time, she screamed.

Looking at her from her husband's eyes was a bewildered and frightened stranger.

When Whitley-Dale reached the engine room door he was almost bowled over by the rush of juniors and cadets from that compartment.

"Hey! What's the rush? Where are you all going?"

"Something's wrong!" shouted Pawson. "They yelled to us to get out and get clear!"

"I'm going in!"

Later, he found it hard to analyze his motives. It was, he had to admit, curiosity rather than courage. And there was, undeniably, a strong element of pure braggadocio. The door was sliding shut—not fast, but fast enough to make haste on his part necessary.

So it was that he was right in line with the narrowing opening when the converter let loose. Violet lightnings blinded him and he felt the sting of unknown radiations on his face and hands. There was very little sound—just a thin, high whine, felt rather than heard. And there was a sense of unbearable tension which, mercifully, lasted only for an infinitesimal fraction of a second. Somewhere, something snapped.

He was still alive. His face and hands were smarting but, as far as he could judge, no serious damage had been done. But he felt a sense of loss, a dreadful sensation that he had been wrenched in two. For long seconds he floated there—for *Martian Maid* was no longer accelerating—gazing about him with a certain dim wonder at the familiar, yet weirdly unfamiliar, details of this part of the ship. At last he realized what was wrong. He was no longer seeing his surroundings through Quentin Dale's eyes. No, that wasn't it. He looked down at his uniform, it was no uniform that *he* had ever worn, would ever wear. He was seeing his surroundings through Quentin Dale's eyes—*but with his own mind.* He hoped hopelessly that it was all a dream.

"Dale! Wake up, man! Are you hurt?"

Whitley looked at Saunders appealingly.

"Hit me, Number One," he

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pleaded. "Give me a smack in the puss—as hard as you can!"

"Are you nuts?"

"No . . . I don't think so. Just dazed, I guess. A good, hard slap might bring me round."

Saunders grunted.

"This hurts you more than it hurts me," he paraphrased. The force of his blow brought tears to the other's eyes, slammed him with a bone-shaking thud against the bulkhead.

And he didn't wake up.

"Satisfied?"

"Er . . . yes. Quite."

"You still look groggy. I'll take charge here. Doctor!" A middle-aged man came forward, the red under the gold of his epaulettes denoting his profession. "Smear some of that goo of yours over Dale here, will you? And then you can carry on up to Control, Number Two, and get a fix and run up our probable orbit."

Whilst Saunders and the others busied themselves with tasks just outside Whitley's comprehension the doctor produced a jar of ointment from the satchel he carried. Its odor was pleasantly aromatic. It was not until he felt its soothing coolness that Whitley realized how much his face and hands had been smarting.

"Roll up your sleeves, Number Two. Hm-m-m. That's all right. Lucky for you, young man, that the shield was in place between the converter and the door—"

"But the others?"

"They'll not be worrying about burns—even supposing that there's enough of them left to get burned! Look!"

Whitley followed the surgeon's pointing finger. He saw a dial—and its needle registered zero in any man's language.

"The hull must have been ruptured. And they tell me that they weren't wearing spacesuits. You're fixed, now. Run along up to your Holy of Holies and do your sums!"

It was indeed fortunate that Whitley knew the ship. He had imagined—*or remembered?*—her so vividly that he was able to make his way to Control without any difficulty. Along the guide rails he pulled himself, past cargo compartments, past storerooms and accommodation, until he came to the lounge.

At the sight of the golden girl—for that was how he was always to think of her—he almost forgot his purpose. Her hair was the color of not too-new gold braid, warmly mellow, and her skin put him in mind of one of those luscious, golden peaches. The short, becoming nurse's uniform revealed rather than hid a disturbing figure. True—he had written of her, but his imaginings—or memories—fell far short of the gorgeous actuality. He envied the passengers, most of whom had been rendered hopelessly spacesick by the sudden transition to free fall, who were now the objects of her tender, albeit professional, solicitude.

She adjusted the straps holding an elderly archaeologist in his chair, gave him a paper bag together with

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full instructions, then turned to greet the Second Pilot.

"Well, Mr. Dale, what kind of mess has the executive department got us into now?"

"I can't quite say, Le . . . Miss Starr. But it's serious. The captain is dead, and the navigator—"

The little mocking lights died in the blue eyes.

"Not so loud—" she warned, waving her hand towards her charges. "Not that they're in any condition to overhear— But what's happened?"

"I can't say." He met her stare of incredulity with one of frank bewilderment. "Honestly, I can't. There was some kind of explosion—and I was just in time to get it bang in the face. I'm still a bit dazed, I guess—"

"Sounds like the converter. But—"

But George Whitley found the spectacle of the sufferers scattered about the lounge even more engrossing than that of the glamorous Miss Starr. It is said that *mal de mer* is as much psychological as physical. The same will, doubtless, be said about spacesickness. Quentin Dale had experienced free fall. George Whitley had known it only in his imagination. The actuality was worse, much worse.

"Give me one of those bags!" he gulped. "Better make it two!"

He grabbed a handful from the astonished nurse and fled up and away for the Control Room.

"Now what?" demanded George Whitley bitterly. "Now what?"

He tried letting his mind go blank, tried to let the memories of the egregious Mr. Dale take charge. But it was no go. The trouble, he decided, was that he had been too much in possession of his own faculties when the transfer had taken place. Had the strange little world of *Martian Maid* been utterly alien to him—George Whitley—he might have got somewhere by the simple expedient of letting Nature take its course. As it was, he was on the verge of knowing, trembling on the very brink of becoming a fully fledged astronaut, but—paradoxical as it may seem—he knew too much. And too little.

He looked around him.

There, in a rack, was an obvious sextant. Which meant that he got a fix by taking the angles subtended by — something — and — *something*. The Sun? Probably. And what else? The First Point of Aries?

He had a sudden rush of brains to the head. In his own time Nautical Almanacs invariably contained worked examples of all the standard navigational problems. The same should—*must*—apply to the ephemerae used by these latter day navigators. Eagerly, he looked over the Control Room bookshelf. But he was doomed to disappointment. He was not to know it—but every article of equipment carried by the liners of space was a legacy from the days of chemical fuel, of the time when—if a ship were to get anywhere—mass had to be reduced at all costs. And formulas carried in the brains of the crew are, ob-

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viously, so much lighter than those same formulas printed on paper, be it never so thin and flimsy.

Finally abandoning his search for worked examples which would allow him to navigate by substitution Whitley found the plotting machine. How many times he had written the words— "He ran up a fresh orbit on the plotting machine," he would not like to say. But now he was face to face with one of the things. And he didn't know what to do with it.

It had a keyboard, rather like that of a typewriter. Above this keyboard was a frame, inclosing a cube of light-spangled nothingness. The bright light in the center was, he thought, the sun. The other lights, with their faintly luminous, almost circular orbits must be the planets.

He examined the keys. Some bore signs familiar to him, homely plus and minus, the orthodox symbols for multiplication and division. Others were strange, but not too alien. "V"s on their sides, facing this way and that, exclamation marks. And some seemed to be part and parcel of a mathematics far beyond his ken.

Experimentally, at random, he punched a key. The machine clicked to itself, and a spot of light appeared no more than half an inch from the central luminary. He punched one or two more, and a curve of violet incandescence extended itself from the tiny Sun to the outermost borders of the frame. Whitley felt happier. He had found out how to run up an orbit—there remained only to discover what data he had to feed into the enigmatic machine before him. He felt sure that if he cudgeled his brains for long enough he would be able to remember the gist of the several articles he had read, from time to time, in science-fiction magazines. He smiled wryly. He had always argued that the first astronauts would have a big edge over the first aviators, inasmuch as everything had already been worked out—even down to the technique of space navigation. He wished that, in his own stories, he had devoted more time to technicalities and less to personalities.

He strapped himself in to the chair that his body had vacated only a short while before, settled down for a good session of intense cerebration. In this he was less successful than he might have been, for the unfamiliar glory of the naked stars beyond the crystal clear viewports claimed all his attention. He could not repress a feeling of exultation that he was among those who were pushing Man's frontier out to those same stars.

"I shall have to call you 'George'. People will wonder if I call you 'Quentin'. In any case, it's a foul name."

"It is not. It has been in the family for generations—"

"So has a tendency towards varicose veins in mine. Oh, I wish I knew whether you really are what you claim, or only the more interesting half of a case of schizophrenia.

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Perhaps— But that can wait till the morning. Good night."

"Aren't you—?"

"NO. I shall be sleeping in the next room. Good night."

"But she can't be!" Whitley was aroused from his reverie by the incredulous voice of Saunders. "She can't be. Look at the Sun, man!"

"Eh? Oh, the orbit— To tell the truth, old man, I've clean forgotten my navigation. Must have been the blast. Blast does funny things to you. I—"

"And you never dreamed of getting us on the intercom and asking me to send somebody else up. Oh no. That would have been far too simple. *If* you're interested, it looks to me as though we've flung ourselves somehow into a fine cometary orbit—which means that in a few days we roast! Out of the way!"

Saunders grabbed the sextant. With rapid precision he took the angles subtended by sun, planet and star. Beneath his practiced fingers the scribbling pad became covered with a network of hieroglyphs. He went to the plotting machine, and those same practiced fingers played the kind of tattoo that Whitley was wont to play upon the keyboard of his own, long familiar typewriter.

Within the cubical framework all vanished but the similacra of Sun and planets. Then a spot of light representing the ship came into being. From it ran a curve of violet luminescence, close, too close, to the Sun. Saunders cursed. He punched yet another key, and from a slot beneath the machine a sheet of paper was pushed out. The Chief Pilot regarded it, puzzlement writ large on his broad face, then screwed it into a ball, and flung it from him irascibly.

"I wish," he said slowly and bitterly, "that you'd clear your offal from Pansy's innards when you've finished playing silly beggars with her."

Viciously he stabbed down with a thick forefinger, then again. The machine whirred and another sheet of paper emerged from the slot.

This one, obviously, was more satisfactory. Its formulas agreed with the curve displayed graphically in the three dimensional chart. But this gave no cause for satisfaction—rather the reverse, thought Whitley, watching Saunders' face.

"And now what?" demanded the Chief Pilot. Obviously, no answer was required, but the other felt impelled to fill the breach in the conversation.

"The radio—" he ventured.

"A blinding glimpse of the obvious!" snarled Saunders. "And you know as well as I do that our chances of being reached and taken in tow before we roast are completely nil."

Whitley thought, hard. Weak though he was in dealing with these latter day technicalities he knew the ship well.

"The auxiliary converter," he suggested. "And the steering jets—"

"No good. Given the time—and the fuel—they'd kill our momen-

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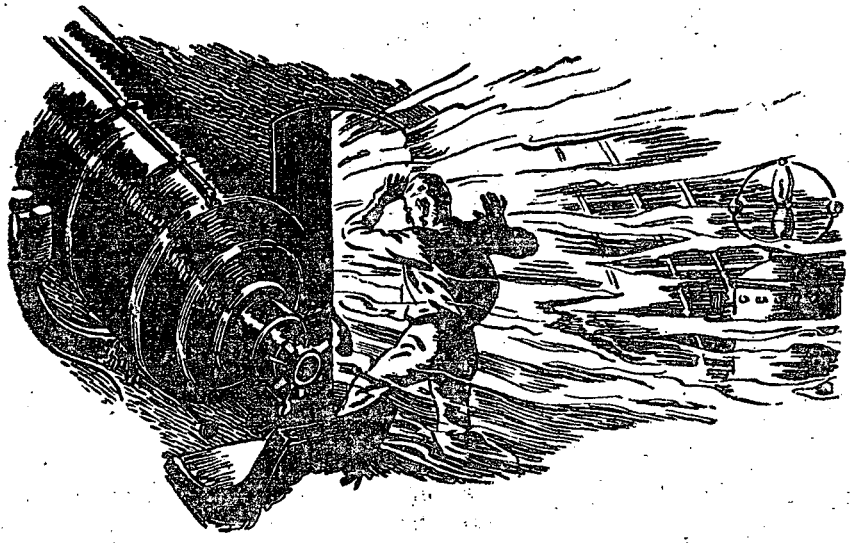

tum. The latter we might manage, but the first— NO."

"Not kill it, Number One, but *use* it! Look, there's Venus. Couldn't we throw ourselves into a closed orbit around her? Or, perhaps, land. Grazing ellipses, you know—" He was rather proud of that one. I must write to Willy Ley about it, he thought.

"Land on Venus?" Whitley felt as though he had just uttered a gross obscenity in a refined drawing room. "*Land*—on *Venus?* Are you completely nuts? But the other idea . . . it's a chance. Run up all the dope, will you, while I go aft and get the auxiliary converter linked up with the steering jets? But I forgot. You can't. Are you sure you can't? What use *are* you, Number Two?"

"I don't know. But if I'm ever going to handle that thing I shall have to start at the bottom."

"Never mind. The quack can give you a run over later." He seized a telephone. "That you, Pawson? Listen—is the skin air-tight yet? Good. No, never mind the fancy trimmings, start straight away feeding the A.C. into the steering jets. Yes, you'll have to shut it off. What are the emergency batteries for, anyhow? I'll be along in a couple of seconds." He turned to Whitley. "Now, Dale, you stay here. If any bells ring, or *anything* out of the ordinary happens call me at once. On this phone." He thrust the instrument into the other's hands. "Pawson will be along to make the initial calculations."

Then he was gone, his gross form vanishing through the open doorway with surprising rapidity.

The next few days were a nightmare to George Whitley. He was

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not used to being a passenger, yet he had no choice but to stand to one side and watch the others engaged in tasks that, in spite of their being on the very verge of his comprehension, were still incomprehensible. The devil of it was that he knew the ship. She was *his* ship. Every smallest detail was as he had envisaged it for his story. He knew the crew and the passengers intimately, with the exception of those characters that he had not troubled to develop. In one thing only had his imagination been at fault. He had seen Venus as a populous world with great windjammers—on a planet with perennial trade winds what need for power?—plying their trade between the island empires. *Martian Maid* was to have made her forced landing in the Venusian sea, her crew were to have fallen into the hands of pirates. No, not space pirates—just the kind of buccaneer that one always associates with sail and salt water.

But Venus, obviously, was not colonized.

The very name of Venus, to put it mildly, stank.

He would have liked to have asked the others just what was the state of affairs on the Star of the Morning and the Evening but did not care to expose his ignorance still further. He would find out eventually, he knew.

And so he spent all of his waking hours in Control—not as a real watch officer but what, in his own time, he had been wont to call a glorified *puri wallah*. Just a lookout, pure and simple. There was no doubt about his simplicity.

He had his meals there.

And it was there that he was visited by the surgeon, accompanied by his aide.

"Well," said the officer, "if you can't remember, you can't remember. And that's all there is to it. As a matter of fact, if it's any comfort to you, such cases aren't too rare. The funny part about yours is not that you remember too little—but that you remember too much. The usual victim of this type of blowup—if he survives, that is—seems to have the idea that he's a man from some other age; just a temporal traveler dumped into an environment utterly alien to him. But you— You know all of us, you know the ship. It's only your specialized knowledge that has been wiped out."

"But he *has* changed, Doc." Whitley felt uncomfortable under Leonora Starr's close scrutiny. "He's not Quentin Dale as *we* knew him. He's more mature, somehow. And he's—different."

"Rubbish, Leo. Well, Dale, I must be getting down to look at the passengers. One or two are finding the prospects of a possible landing on Venus conducive to a nervous breakdown."

"Will you want me, Doc.?"

"Why, yes, Leo. You do more good to the men than I could ever do. Why?"

"Oh, nothing. It's just that I thought I might be able to drag Mr. Dale's lost memories back into the light if you left me with him."

"Hm-m-m. Possibly. As a

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qualified nursing sister you should know more practical psychology than a humble G.P. Yes, you can stay."

"This is the Admiralty, George."

"But they'll never see me. I've learned enough about this cockeyed world and time of yours to know that a mere Second Mate is practically a minus quantity."

"Yes, they'll see you. Look in your pocket, your breast pocket. That's where George always kept his cards. Now . . . here's a pencil . . . just write on the back of one, 'I remember.' That's right. Now sign it. No, not Quentin Dale *you fool.* George Whitley. *That's better. Hey, you with the brass buttons! Will you take this card up to the First Sea Lord, or whoever's in charge? No, we have no appointment. Yes, it is urgent. And I can tell you right now that my Lords Commissioners are going to take a very poor view of* you *if we get turned away from their very doorstep. Mr. Whitley has been here before."*

"Here he comes back, Jane. Suppose they do let us in—what do I tell them?"

"That you've remembered how this ray of yours worked; that you can protect London from the V weapons."

"But I haven't remembered. And I told you that I was very shaky on magnetronics."

"You know more than any man alive today. And you'll have time to experiment. And if the gadget should blow up—then you stand a chance of getting switched back to your own time."

"Thank God for that!"

"What? Oh, so they'll see us, will they? I told you so. Come along George and tell your tale to the nice admirals."

"Cigarette?"

"Thank you, Leonora."

Whitley took a little cylinder from the proffered case, tapped the end smartly on his thumbnail to ignite it, then put it to his mouth. He looked sideways at the girl, who was strapped in the other chair. He was too shy to look at her directly. Contributary to his embarrassment was the knowledge that, in his other—but not more real—life, he had given the heroine of his story a rough passage.

"Leonora?" Fine eyebrows arched quizzically over the blue eyes. "Coming on, aren't we? Well, I'm going to cut out the 'Mister' and just call you Dale. I could call you Quentin, but it's a foul name."

"It is not. I thought of it. I mean it's been in my family for generations."

"So has a tendency towards varicose veins in mine. But you're not Quentin Dale. I'm sure of that. You may, of course, just be the more interesting half of a case of schizophrenia—but I don't think so. Besides—I've just read Malinowski's 'The Mass Subconscious in Relation to the Space-Time Continuum.' And— But who *are* you?"

Whitley dragged at his cigarette.

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He looked away from the girl, out through the viewports to where Venus, a huge, flawless pearl, hung among the lesser gems in the black-velvet-lined jewel box that was interplanetary space. The temptation to drop the masquerade was overwhelming—but he had no ambition to find himself in a lunatic asylum, or its latter day equivalent. He looked again at the girl. There was something about her that reminded him of Jane, something that he could trust implicitly. Yet, professional teller of tall tales that he was, he hesitated to tell this tale the utter fantasy of which lay only in the fact that it was true. Had his companion been of his own sex he would never, in all probability, have told the truth.

"My name is Whitley," he said, "George Whitley. I come from the Twentieth Century. Dale, I suppose, is one of my remote descendants. Potential immortality of the germ plasm, you know; continuity of the world line and so forth—"

"Nuts," said the girl. "Completely, utterly and irrevocably nuts!" But there was that in her eyes which belied her words. "At least, that's what I'd say if I didn't know you weren't Quentin Dale. But go on."

"I don't know quite where to begin—"

"That's simple. Who are you, where do you come from, and how did you get here?"

"Do you have such a thing as science-fiction in *your* time?"

"Yes. Do you have fan clubs in yours?"

"Yes. Well, you know what a fan is, evidently. That's something towards it. I was . . . am . . . one. Worse, I started to write the stuff. Not without," he said modestly, "a certain success. My real profession, however, is that of a ship's officer. Surface ships, of course, on Earth's seas."

"Oh! Windjammers and galleons and things! You know, that age of sea transport has always fascinated me"

"*Not* windjammers. And certainly not galleons. We wandered around in iron cargo boxes driven either by one of the forms of steam engine, or by internal combustion engines. There *was* glamour, I suppose, otherwise they'd have got nobody to sail their blasted ships. Unfortunately by the time if wore off it was too late to make a fresh start elsewhere.

"Well, I was at sea during World War II. My ship was in a very important convoy; so important that the future course of the war depended upon its getting through. At the time I was writing one of my science-fiction stories—a story of the future. I imagined the whole Solar System, with the exception of a colony of free men on Mars, under the iron heel of a fascist dictatorship. I got to the part where my hero, having stolen the plans of a secret weapon from the fascists, cracked up on one of the asteroids. He was being hotly pursued by the Aryan Navy, and his only hope was to try to assemble the weapon from

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makeshift materials and fight off all attempts to capture him.

"I was dreaming of this, with myself in my hero's place. As his weapon blew up in my dream—the alarm bells rang aboard my ship. The shock of one or the other—or both—caused a transfer of personalities. I was him, and he was me."

"What happened?"

"He died. Unpleasantly. But it was *I* that died. Do you understand?"

"I think so. And what else?"

"Well, his mind was in my body, back on Earth, in the Twentieth Century. Apparently he was clever enough to pass himself off as me. But he was determined to make his beastly weapon and change the course of history."

"And—?"

"He did. He fought off a determined bomber attack. But the weapon, being made of makeshift materials, blew up—and back *I* came, completely dazed, to a scene of unparalleled confusion. And they've been trying ever since to get the secret of the blasted thing from *me*."

"But how come you're here and now?"

"The same kind of thing happened again. I was home on leave in London, and I was writing a story about *this* future. I had a dream about it—with myself as Quentin Dale—and just as the converter blew up *here* a V-2 must have landed *there*."

"V-2's? What were they?"

"The great granddaddies of this beast," he patted the control panel affectionately, "but *they* used 'em as long-range artillery."

He fell silent. Up till now he had not thought of Jane and Patricia. The bewildering wonder of his experience had driven all else from his mind. He realized dully that he should have thought of them long before this, but told himself that all the worry in the world would make not one iota of difference to what had already happened. But the mere fact that he was here, in Quentin Dale's shoes, was proof positive that Patricia, at least, had survived whatever unpleasantness had occurred. Or was it? He looked intently at his dim reflection in the polished control panel. There was, he had to admit, a certain faint resemblance to the central character of a long forgotten episode of his past.

"The ancestral ape from the family tree, in person," Leonora Starr's voice was faintly mocking. Then a note of solicitude crept in. "But what's the worry, Dale?"

"I'm wondering what happened to Jane and Patricia. They're my wife and daughter," he hastened to explain. "I feel just lousy clearing out like this and leaving them in a city under fire."

"Don't worry. It wasn't your fault. And if it comes to a showdown the London of your time is probably far preferable to an out-of-control spaceship hell bent for Venus!"

"Yes, Venus. I've been wanting to ask—but haven't dared to display

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my ignorance. In my story it wasn't a bad sort of a place—"

"But this isn't your story. Somebody else," she smiled at the fancy, "is feeding his thoughts into the dictograph. Do you know what they call Venus? The Planet of No Return. True, they haven't sent many expeditions—only six all told—but each one has been better equipped than the last. And their ships have just dipped down beneath the eternal clouds and—they've never come out again. If only radio communication were possible from the surface! Then the next comers would have known what it was they had to fight."

"Hm-m-m. Charming prospect. But we should be safe enough in a closed orbit."

"That's what *you* think. But please remember that all that kind of thing went out with the coming of atomic power. You people still have to know the theory of it all for your examinations—but not for generations has anybody done it in practice.

"Which reminds me. For an alleged man from another age you are remarkably well versed in some aspects of astronautics. Other cases of this temporal transfer of personality have been known—but invariably the victims have been completely lost and bewildered in the new environment."

"Moral: Read science-fiction," replied Whitley.

Broad on the beam, Venus was a snow-covered continent in the sky. Ever and again, intermittent, disconcerting, came the thunder of the steering jets. To Whitley they were almost terrifyingly violent, but to those accustomed to the full-throated roar of the main drive they were but a feeble echo of *Martian Maid's* rightful song of power.

Over the controls sat Saunders, his surprisingly agile fingers playing over the keyboard like those of some master pianist. At the plotting machine Pawson fed in data, called the resultant figures to his chief in clipped, staccato accents. Jenkins was aft in the engine room, anxiously watching over his little converter lest it follow the example of the late prime source of power. Fascinated spectators were the cadets and George Whitley.

Whitley watched Saunders. He saw how the beads of perspiration trickling down the chief pilot's face were driving him almost to desperation. He knew that the other would have sold his soul to have been able to put up a hand to wipe them away—and knew that he dare not take either hand from the controls. With the pitifully weak power at his disposal there would be no second chance if he muffed the maneuver.

Whitley put his hand in his pocket and felt for his paper handkerchief. He didn't care if Saunders did think that he was trying to curry favor—this was something useful that he could do. Before he could carry out his intention the engine room telephone buzzer broke the tense silence. The cadet who was nearest the instrument an-

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swered, saying "Control" in a boyish, striving-to-be-official v o i c e. Then: "Mr. Saunders! Mr. Saunders, sir!"

"Yes?" The chief pilot did not look up from his controls, but his voice was taut with anxiety. "Yes? What is it?"

"Mr. Jenkins says will you cut the drive, sir! At once, sir!"

"Tell him I can't!"

"Mr. Jenkins says that if you don't cut the drive fast, sir, there'll be no stern left to this ship!"

Saunders' hands made a last rapid pass over the instrument board, then fell limply to his side.

"That's mucked it," he said bitterly, to nobody in particular. "That's mucking well mucked it. Why they couldn't leave well enough alone and leave us with the old Mark VII converters, Heaven alone knows. And it would be us to make the first run with these mucking Mark VIII's!"

"What now, Number One?"

"Unless Jenkins gets the auxiliary converter fixed in time—"

"He says it will take at least six hours, sir"—interpolated the cadet. ". . . It means the grazing ellipses that Dale here has been burbling about. And, personally, I think we should be better off if we let her crash. Was the parachute checked at Port Massingham?" he fired suddenly at Whitley.

"Yes," replied the temporal castaway automatically. It had been in his story, anyhow.

"And when do we make first contact, Pawson?"

"At 18:00 G.M.T. Just two and a half hours from now."

"Well, we'll go aft and try to get things straightened out before it's too late. Dale, you stay here and give us a buzz if you want us!"

Those two and a half hours were the longest that Whitley had ever spent in *his* life. They weren't the longest that he had spent in other people's lives—a like period as Quentin Dale I in the hands of the vengeful Aryans was several eternities longer. Still, this was quite long enough for the tastes of most people. Had he been able to make computations regarding the future course of events it would not have been so bad. But his status was that of a uniformed passenger.

Through the ports blazed the white glory of Venus. He would have thought it beautiful, were it not for the information he had gleaned concerning the state of affairs on that planet. It wasn't much—only that there was something there definitely lethal to visitors from outside.

And yet, it was beautiful. Relative to *Martian Maid* Venus was now in quadrature. Half of the sphere shone dazzling white, the other half was in darkness. But it was not darkness unrelieved. Electrical storms must have been raging below the eternal clouds, for every now and again an evanescent violet glow suffused the dark face with a fleeting opalescence.

Abruptly Venus was no longer a sphere. It was a vast bowl. The ship, apparently, hovered some-

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where above its center. It seemed that she was motionless—until one looked at the racing shadow fast leading her on to the dark side. And then the little shadow was one with the vast shadow of the Venusian night.

Almost simultaneously a thin, high screaming became audible. It may have been imagination, but it seemed that the temperature of the control room rose suddenly and appreciably. Whitley picked up the phone and pressed the button.

"Mr. Saunders? First contact established," he said.

"Then that's that. Hang on there, anyhow. Even if the auxiliary jets can't pull us out of this mess now, they can, at least, help us to make a decent landing."

The screaming of tortured atmosphere ceased. The ship was once again in her native element. It would be several hours before the next contact—exactly how long he could not say. But there was nothing now to see on the Venusward side but the darkness lit by its flickering half lights. On the other side were the stars—but Whitley had become blasé in a surprisingly short time. He felt in his breast pocket for his case and took out a cigarette.

"Thanks. I'll have one, too—"

Slim fingers took the case from his hand before he could return it to its resting place. Whitley turned. Standing—or, to be more exact, floating in the air—behind him was Leonora Starr.

"Thought you'd be lonely," she said. "So I came along to keep you company. Here's some sandwiches and coffee."

"Thanks!" Whitley gratefully accepted the packet and the thermocarton. "But what about the others?"

"They're being taken care of. Don't worry about them. . . . And so we're the fools that are going to rush in where angels fear to tread."

"Who told you?"

"Saunders. I had the job of breaking the joyful news to the passengers. Oh, they took it very well. But I had a hard time tearing myself away from that old goat Dr. Gillespie, the archaeologist. Do you know—he has a theory that Venus is inhabited by an intelligent race?

"And why not?"

"But that's not all of it. According to him these brainy Venusians once possessed the secret of interplanetary travel—he babbled a lot about mysterious lights in the sky and some scientist of what must have been your age called Fort—and they resent most keenly anybody else being able to do what they did in the past. So they just nobble them. Fantastic, isn't it?"

"Maybe. But remember that I am—or was—a professional fantasy hound. Doesn't seem too odd to me. And some of Fort's mysterious happenings do seem to prove to the fact that ships *have* come in from Outside. And the fact that so many of these suppositious vessels seemed to land in or take off from the sea presupposes an aquatic or amphibious race. And I suppose that Venus

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is nearly all water. We used to think so."

"We shall soon find out."

Whitley dozed a little after the girl left him. He possessed the faculty of instantaneous awakening in the event of anything's being amiss, and so it was that the second contact found him nervously alert with the first sounds of atmospheric skin friction.

There wasn't anything he could do about it except report it to those working aft. Saunders grunted an acknowledgment but did not seem to attach any great importance to the pronouncement. But it seemed to Whitley that the period of atmospheric flight was appreciably longer than it had been on the previous occasion. But there was nothing that *he* could do about it.

Then he decided that there was. Something had been worrying him for some little time—something most definitely wrong on which he couldn't quite place a finger. He had tried to place it by having recourse to Quentin Dale's memories—but, they, as always, remained just on the wrong side of accessibility. It seemed hardly likely that anything in his own, Twentieth Century experience would supply the key to the problem. But he had read well if not wisely, science-fiction stories without number as well as standard works on rocketry.

Suddenly he saw what was amiss. *Martian Maid* was coming in bows first. This would mean that the steering jets would be useless to brake her momentum when she entered the atmosphere for the last time. There was, of course, a slim chance that Saunders would be able to swing her—but with only the feeble output of the auxiliary converter to oppose both inertia and air pressure that was doubtful. Furthermore—only when coming in stern first could the parachute be used.

He rang the engine room again.

"Yes?" Saunders' voice betrayed the fact that his nerves must be on edge. "What is it?"

"Hadn't we better swing her, Number One? Once she's inside the atmosphere for keeps we shan't have a chance."

"Swing her?" The chief pilot's voice was that of a man dog-tired and on the verge of collapse. "Swing her? You can do what you please with her!"

So that was that. It was obvious that he could expect no help or encouragement from aft. He didn't even know whether or not he would be doing the right thing. But, he told himself, the principles of practical rocketry could not be so vastly different from the mass of theory laid down in his own time. He had seen the little set of controls labeled *Gyroscope*. He had assumed that they governed the motions of the flywheel with which the direction of the ship's head was set when falling free. Now he looked at them more closely.

There were three buttons. One was marked "Gyroscope in fore and aft plane," one "Gyroscope in athwartships plane" and the other

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"Gyroscope in vertical plane." He found time to wonder how one decided which was port and starboard and which was up and down.

In this case he couldn't be sure whether to set the wheel to "Athwartships" or "Vertical." One of the two would mean that he was merely rotating the ship on her longitudinal axis. Unless all these ups and downs and ports and starboards referred to the axis of the gyroscope and not to the direction of rotation. There was only one way to find out.

He pressed the button marked "Fore & Aft." Somewhere in the bowels of the ship an electric motor hummed briefly. Good. The humming ceased. Whitley next pressed the button labeled "Start." The humming began again—this time on a slightly different key. He feared at first that he had made the wrong choice. This would not have mattered had there been ample power at his disposal—but lights and all kinds of auxiliary machinery had been running off the emergency batteries ever since the small converter had been called upon to usurp the functions of the main drive.

Right ahead was Orion, sprawling in lazy splendor across the frosty black of the airless heavens. The ship's nose—the intersection of the struts of the transparent structure made a good cartwheel sight—was centered fair and square on the nebula of the giant's Belt. As *Martian Maid* swung in her orbit around Venus an East-West motion should have been—and was—imparted to the fixed stars. But now her head was swinging from South to North as well. Castor and Pollux, the Heavenly Twins, came into view, then the great Sickle of Leo, the lion of the northern sky. The Great and Little Bears came next in the slow procession, followed, after an interval, by the Herdsman.

When the Eagle swung into view Whitley decided that he was far enough round. He pressed the button marked "Stop" and hoped for the best.

To him came Leonora Starr, bearing a thermo-carton of tea and a fresh supply of sandwiches. She looked apprehensively out of the ports to where the Planet of No Return hung vast, dark and menacing. She shivered. Then—

"You'll have to bring her down, Dale."

"Who? *Me?*"

"Yes, you. They had a flashback from that beastly little converter—and Saunders and Pawson are temporarily blinded. Doc says it will last for several hours—"

"But Jenkins—"

"You know . . . or do you? . . . that he's only just out of his time. Just a cadet with a smattering of engineering knowledge on top of his college training."

"But even the cadets—"

"You can't get out of it, Dale. You swung the ship just now; that shows you know *something* about the job. You probably know just as much about this grazing ellipse business as anybody here—which isn't very much, I admit. But

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here's the crux of the whole matter. In your own time you were a responsible officer. The ships in which you served were as different—as ships—from this one as chalk is from cheese. But you were a responsible officer with lives under your feet as you walked the poop or the bridge or whatever you called it. You couldn't afford to make mistakes."

"But—"

"There's no 'but' about it. Jenkins frankly admits that he hasn't got the nerve. The dogs would try their hands at it willingly—but I wouldn't trust those puppies with a cage of white mice. You do it—and that's final!"

Whitley lay back in his chair. He took a pull of the hot, strong tea through the tube of the thermocarton. He grinned.

"After all, Leo," he remarked, "it doesn't make much difference. As far as I can see it just boils down to a choice between accidental death in a crack-up and being murdered by some person or persons unknown."

Whitley knew, when *Martian Maid* grazed for the fourth time, that this was it. Had he known how to use the instruments they would have confirmed the hunch—but his hunch was so strong that he didn't bother to ask Pawson who, white and shaken, had taken his place in the other chair, to check up.

The almost intolerable keening of atmospheric friction did not die away as it had done in the past. Instead its pitch became appreciably lower. They could feel the ship vibrating as the molecules of air rushed over and around the countless little irregularities of what appeared to the eye to be a perfectly smooth metal skin. The periscope was now in use. Looking into it Whitley could see nothing but white, opaque cloud under his stern. Ahead, the stars were still visible. He heard one of the two cadets who were in Control say to the other—"Take a good look at the stars, Bill. It's the last you'll ever see of them!"

"Cheerful little swine," thought Whitley absently. *"Trouble is that they're probably right. Wonder if Cameron would give me a good obituary in Stellar Stories if he knew? Look good, wouldn't it? One of our most promising young authors has perished whilst making a bollix of a landing on Venus. Meanwhile—what does A do next?"*

Abruptly the starry sky was gone. All that could be seen from forward was featureless mist—not white or gray but of a delicate golden tint. It reminded him of Leonora. *"Come off it,"* he told himself, *"this is no time for daydreaming. Even if it is only a dream."* He put up his hand to mop his face—for it had grown almost unbearably warm. He looked at the air speed indicator. It was no help to him—the needle was hard against the stop.

"This converter," he said to Jenkins. "I suppose—"

"Didn't I tell you? Well, it's like this. If you switch on, it will convert itself into power."

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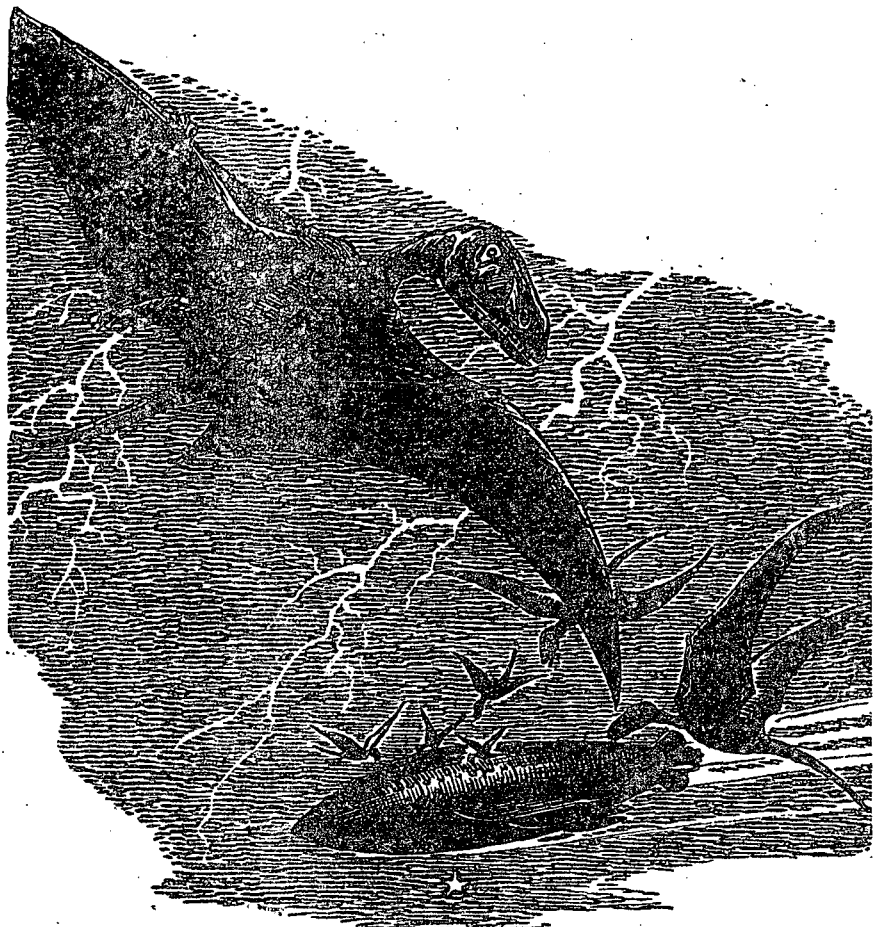

"And the result?"

"Number Six bulkhead should hold—after all, it's what it's built for. But there'll be no stern left."

"We'll just have to land without a stern. Look, Jenkins, we're coming down completely blindfold—and I must get the way off the ship before we crash into a mountainside—if there are mountains here. And I daren't release the parachute at *this* speed—"

As he spoke the golden light faded fast and then died. It was dark now, but a darkness lit by almost continual flashes from below. Unrelieved blackness would have been better than this intermittent effulgence, it confused rather than aided the senses. Whitley thought he saw, in the periscope mirror, a great, shadowy mass a little to starboard of their uncharted course. It may have been imagination, it may

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have been nothing more substantial than cloud, but it made his mind up. He pressed the firing key.

The deck came up and hit him. Dimly, as from very far away, he heard minor crashes and rendings as the sudden deceleration tore fittings of all kinds loose from the bulkheads. But, as he was to discover later, there was surprisingly little structural damage. The ship had been built to stand far greater accelerations, it was only the suddenness of it all that tested various unimportant gear to breaking point.

Dazed, he shook his head. Blood was streaming from his nose and tasted sickly salt in his mouth. He could not see—and then he was seeing dimly through a red mist. He shook his head again. The mist cleared, but his vision appeared to have been impaired. Then an intensely vivid lightning flash forced upon him the realization that this was because only one lamp in the control room remained unbroken. By its light he could just see the air speed indicator. The needle had pushed past its central position of Zero, was still recording a forward motion. Then, slowly at first, but with increasing rapidity, it fell back. As it passed zero Whitley pressed the button marked "Parachute Release."

Just below the nose a circular strake of plating slid sternwards. From the recess, which ran right around the hull, billowed the big parachute. They saw its folds and convolutions slide past the viewports, and then it was open above them. Annular in shape, it was. Through the opening directly above, an opening barely greater in diameter than the hull, they could have seen the sky—if there had been any sky to see.

The motion now was that of a descent in a not too rapid elevator—provided that one could imagine that the skyscraper which it served was being violently rocked by the worst earthquake in all history. Whitley expected the pendulum motion to diminish with the passage of time, but it became worse. The Venusian upper air must have been like a boiling caldron. The cloud was thinning now, and they could just see from Control the nearer guy ropes of the parachute. Outlined as they were with pale St. Elmo's Fire they stood out with startling clarity against the dark, formless mist. It was frightening to see them, first on one side and then on the other, hang in bights as the ship swung, and then come taut with a jerk that must surely have snapped any Twentieth Century cordage. Whitley became aware that a definite rotary motion had been imparted to the ship in addition to her swing. The combination of the two was peculiarly nauseating. He gulped. But he couldn't afford to be sick.

More with the idea of occupational therapy than anything else he turned to Jenkins.

"What about some flares?" he demanded.

The engineer groaned.

"Flares, Pettigrew!" he ordered weakly.

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The cadet addressed staggered feebly to a locker. He took from it a cylinder about six inches long and three in diameter. He unscrewed the cover of a tube to one side of the control room, inserted the flare and replaced the cover. He did something—Whitley didn't see quite what—and with startling abruptness a blinding, blue-white sun burst into being beneath the ship. The intense radiance was reflected from the mists all around them and from the underside of the parachute. The interior of Control was as light as high noon in the tropics.

Whitley looked into the periscope. The glare was blinding—but that, in itself, was a good sign. It showed that some, at least, of the lenses and mirrors had escaped destruction in the explosion. He snapped a filter into place. He could see the flare itself now, a diffused ball of radiance drifting rapidly to one side. In the center of the field of view was a dark, circular patch. Those object glasses right aft must have gone.

Slowly at first, and then with increasing rapidity, the light of the flare diminished. The parachute lines were once again visible as lines of fire etched upon the circumambient night. Only the flickering barrage of the lightning relieved the darkness. It seemed that it was far brighter than before. It may be, thought Whitley, that it just seems so bright because the flare has gone. It may be—

Once again, he looked into the periscope. Coincident with his action a streak of lightning played in brief, incandescent splendor directly below the ship. It seared itself upon his retina in all its subtle tracery of veining and veiling—a tracery unblurred by any intervening cloud.

"Another flare, Pettigrew quick!" Hard on his words the light was released, the projector was already loaded. "Look into the periscope, Jenkins, tell me what you see! That last flash of lightning has blinded me."

"We're out of the clouds, Dale. We're still a long way up. Can't see much, that blasted flare is hanging right under us."

"When do we land?"

Whitley swung at the sound of the voice that had come to mean much to him. He had often heard, and often used, the expression "a sight for sore eyes." Looking at Leonora he forgot that his own eyes were still watering and smarting.

"What's it to you?" He had to be brusque, rude even. He did not want the others to see how much he cared for the girl. She would know that no offense was meant.

"Just idle curiosity. As a matter of fact the passengers, now that they've recovered from having their vertebrae poked through the tops of their skulls, are getting rather restive. And it's all that we can do to restrain Saunders. He's convinced that you're plunging us all to certain destruction."

"I probably am."

"Look!"

There was that in young Pettigrew's voice which made instant at-

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tention imperative. They all swung, followed his pointing finger. They saw something vast and dark sail past Control on huge flat wings. It was gone before they could gain more than the most fleeting impression.

"What was it?"

"Don't know. It seemed to come flapping up from below somewhere."

"Was it a flying machine?"

"No. *No.* I saw its eyes—"

"Here it comes again," called Jenkins. "And it's brought all its pals with it!"

Like a squadron of huge, ungainly bombers the flying things winged into sight. There was some attempt at formation, even, although any regularity must have been hard to achieve in that maelstrom of conflicting aerial crosscurrents. They flew as fly certain Earthly seabirds, rising and falling, banking and turning, with barely a quiver of their broad, flat pinions.

There was little doubt that they were reptilian—or the Venusian equivalent of reptilian. Apart from their size they could almost have passed for living reconstructions of the pterosauria of Earth's past. The wings were not quite the same—they were broader, less graceful—but the general plan of the beasts was surprisingly similar.

Deterred by the tracery of the parachute rigging they hovered level with the control room, regarding its occupants with avid eyes. Their jaws opened and shut, revealing yellow teeth. From their mouths dripped a green slime.

"Wonder if the natives are friendly?" cracked somebody.

"They're certainly hungry," returned Leonora with a shudder, "I'm used to being stared at—but not in *that* way."

"Turn the light off, somebody," suggested Whitley. "Perhaps if they can't see us they'll go away."

Pettigrew complied.

The flare was still falling and burning below them. There was no longer cloud all around them to reflect its radiance into Control, but the underside of the parachute still filled its functions in that respect. Turning off the one, feeble lamp left to them made no difference. The flying reptiles still hovered, still stared in through the big ports with an interest that was purely gastronomical.

The flare died. With its extinction, as though the coming of the dark gave them added courage, two of the monstrosities came in to attack. Those in Control could still see them, for their eyes and mouths glowed with a green luminescence. It is doubtful whether they would ever have been able to penetrate the tough plasti-glass, but they never got past the rigging. This was still hanging slack and jerking tight with *Martian Maid's* pendulum swing, and it so happened that one of the creatures became inextricably entangled. It must have got at least a dozen round turns around neck, and wings, and tail.

It was tough. It seemed that it must be decapitated, torn to pieces, each time the cordage snapped taut.

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But it lived. It stayed in one piece. And it struggled.

To the motion to which all had become, to a greater or lesser degree accustomed, was added a new movement. The ship was shaken violently—as is a rat by a terrier. Leonora had left the door open when she came up from the body of the ship, and now from below drifted curses and frightened screams.

Stanley, one of the cadets who was helping to maintain order between decks, poked his head through the opening. "Mr. Saunders wants to know what is happening, sir. The passengers want to know—"

"Tell them 'nothing'," lied Whitley. "Tell them that everything is under control!"

Pettigrew took it upon himself to release another flare. By its light the confused jumble of eyes, mouths and wings outside the port sorted itself out. They saw that the thing's mates had come to its assistance, that with tooth and claw they were tearing at the parachute rigging. As they watched, fascinated, they saw one guy rope part, and then another. They had been designed to stand up to all the stresses that *Martian Maid* would be subject to in any emergency—but she was a regular trader. A landing on Venus was not on her itinerary.

"I'd better go down," said Leonora. In her voice the desire to put metal decks between herself and the unpleasant sight struggled with the disinclination to remove herself from the ranks of those who knew what was happening. "I'd better go down. After all, it *is* my job. Don't breathe a word to the passengers, Stanley, *I'll* handle them. I'd better handle Mr. Saunders and Mr. Pawson, too. Let me know if the worst comes to the worst, Dale."

"I'll keep you informed. I'll—" He had his eye glued to the periscope eyepiece, was ignoring the struggle outside. "Looks like water down there. And plenty of it. And one or two islands."

"About twenty guys gone," reported Jenkins without emotion. "There go another two."

"We haven't far to go now."

The sea under his stern did not look inviting. Even from this height the wave crests were plainly visible. It seemed literally boiling around the islands, with their offlying reefs, that he could see. A dreadful thought occurred to him. What if it *were* boiling? *Really* boiling? Time enough to cross that bridge when he came to it. There was nothing that he, nor anybody else, could do about it.

With the breaking of most of the guys on one side the ship had ceased her gyrations. The undamaged half of the parachute filled and held the wind. By some freak of chance the whole affair achieved a certain stability. *Martian Maid* was still making considerable leeway, but now she was also gliding into the teeth of the hurricane. That was to the good. When she did hit—be it land or water—the force of the impact would be considerably diminished.

He became aware that the violent

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shaking had stopped. A sound like a cheer made him turn his head. "What is it?" he demanded, "the United States Marines?"

"I don't know what it was, Number Two. Something big, with a streamlined body and wings. It just swooped out of the night and nobbled the beast that was tangled in the guys—and a couple moré with it. It looked like a flying fish."

"Maybe it was. But slip down, one of you, give Miss Starr my compliments and tell her *landing stations*. We'd better get strapped in, too."

He could not see very well now. With their accelerated rate of fall they had overhauled and passed the last flare, which now hung low in the sky to leeward. Below the ship was black mystery, and confusion worse confounded by the unsteady, fitful glare of the lightning. Another flare, he concluded, would only dazzle him. And according to the rough estimate he had made of drift they should, with luck, just make one of the larger islands he had seen. They should—

The downward motion stopped, became an entirely new and utterly sickening movement. With her stern just skimming the crests of the heavy seas *Martian Maid* skittered over the surface, her nose upheld and dragged to leeward by the parachute. At times she would incline at a steep angle from the vertical, and then some freak gust would balloon the folds of silk and she would straighten with a jerk.

But it couldn't last. Even in this hurricane it couldn't last. Yet more of the guy ropes parted, the wind spilled from the parachute and the bows toppled and fell with slow deliberation into the chaotic welter beneath. As the ship assumed the horizontal a great breaker reared itself above her burst and twisted stern, broke with irresistible force against the already overstrained Number Six bulkhead. Had it not been already weakened by the explosion it would have held. But plates and frames buckled and gave. Through the central well poured a flood of warm, brackish water. The next sea did not break. Freakishly, the stern lifted to it. Before those in Control had time to collect their scattered wits they were struggling and drowning, hopelessly trapped by the very straps and webbing they had donned for their safety.

George Whitley's last thoughts, as he fumbled clumsily with the fastenings of his safety belt, were bitterly ironical. If he had come all the way in Time and Space only to be drowned, he might just as well have stayed put.

He thought at first that it was Jane bending over him. Then his eyes cleared, and he saw that it was Leonora. He heard the doctor say "He'll be all right now," and wished that the quack felt as bad as he did.

Leonora— But she belonged in that crazy dream about *Martian Maid*. He felt the deck lift and scend beneath him and knew that, wherever he was, he was aboard no spaceship.

He could hear, somewhere, the howling of the wind, the roar of a

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hungry sea, the ominous drumfire of almost continuous thunder. It must be somewhere in the Tropics, he thought. For the air was hot, and smelt of swamps and mud, and there was that indescribable spicy smell—but, somehow, far more sickly—that one gets on the offshore breeze from Java.

The woman—who *was* she?—was bending over him again.

"Dale, wake up! Wake up!" Then— "George! Wake up!"

"I am awake," he said irritably. "What's the hurry? Is it one bell?"

His eyes came ungummed properly and he was able to look at his surroundings. He looked first at the golden girl. Her once trim uniform was a mess, there was a long scratch over her right eye and her hair was wet and looked as though she had been dragged through a hedge backwards. She looked worried, so Whitley tried to force what he hoped was a reassuring grin. "There's nothing to worry about," he said vaguely and optimistically.

"There is! There is! Come and see!"

Why couldn't these people leave him alone? Why— He closed his eyes again, only to jerk them open when somebody's hand connected with his face with a resounding slap. This time he woke up properly. He rose unsteadily to his feet, glanced swiftly around at the scene of confusion. Gear of all kinds, personal effects, stores and cargo were littered around. What should have been decks were now overhead. It was hard to say which was the new deck, for the ship was tilted at an angle of roughly forty-five degrees from the vertical.

"I'm going aft," he said. "I can't see anything from down here."

"You might thank Leo for saving your life," said the doctor stuffily. "She pulled you all out, one by one."

"Skip it," said the girl. "The most important thing now is to help Dale to save everybody. Mind if I come along with you, George?"

"The pleasure is mine," he replied automatically. The feel of a ship in a seaway beneath his feet was making him feel himself once more. As they picked their way over the assorted wreckage he asked, "Any casualties?"

"None among the passengers. They're just badly shaken up and one or two of the women are hysterical. And Saunders and Pawson are out for the count. But—"

"Yes?"

"Young Pettigrew. I didn't get him out in time—"

"He's just the first," thought Whitley. *"Perhaps he was lucky. Perhaps—"*

His mind, trying to escape from the grim forebodings that it had raised, began to take notice of the state of affairs inside the ship. The forward bulkheads of the cargo bins had burst. This was hardly surprising, as they were not constructed to stand any real weight. The after ones took all the strain during both acceleration and deceleration.

In spite of himself he began to become interested. To a seaman, the nature of an outward general cargo from Earth to Mars could

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not fail to be more than ordinarily intriguing. He saw broken cases from which showed the dull gleam of metal, of polished wooden butts. Rifles? In this day and age? The sight of several blocks and pulleys made him homesick for his own time. And there were coils of wire, thin and fantastically flexible.

And then they came to the twisted remains of the Number Six bulkhead. Whitley clambered through the most convenient opening, to find himself standing on a reasonably level metal platform. What it *had* been before explosions and the sea had bent and battered this part of the ship beyond recognition he could not say. But it was useful now.

It was very dark between the flashes of lightning. The continuous thunder was almost drowned by the screaming wind and the roaring, hungry sea. Surprisingly, Whitley's vantage point was well protected. Over his head, to windward, curved the remains of one of the big tail fins. All that reached him was an occasional shower of warm spray.

Gratefully, he inhaled deeply and filled his lungs with the fresh air. It had been hot and stifling inside the ship. And then he found that the same conditions prevailed outside. True, the air was in violent motion, but that could not conceal the oppressive warmth and humidity, the sickly stench of swamps and corruption.

"What do you make of it?" screamed a voice in his ear.

"So far, we're lucky!" he bellowed in reply. "With her nose down like this she'll tend to ride head to sea. And I suspect that the remains of the parachute are still out forward. They'll make a good sea anchor!"

"A *what?*"

"A sea anchor!"

He began to cough—overmuch shouting had always had this effect on him.

Leonora thumped his back.

"Never mind!" she said. Then—*"Is that a light?"*

Whitley strained his eyes to leeward. At this moment the lightning began to play almost continuously along his line of sight. Dazzled, he had to desist. He felt something thrust into his hands. He could tell what it was by the long familiar feel—a pair of prismatic binoculars.

"I found these among the cargo, sir," came Stanley's voice. "I thought they might be useful."

"They are. Good lad!"

The lightning ceased and there was a relatively long spell of darkness. He could see the light now, without the glasses, a little to the left of the line of drift. It was ruddy, and seemed to blink with mechanical regularity. He found himself counting, as he had so often done in the past to determine the period of a flashing or occulting navigational aid. And one . . . and two . . . and three . . . But a lighthouse here? On Venus? Yet there was no reason why, presuming the existence of intelligent beings making the sea their highway, there should not be.

He didn't know whether to be

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relieved or disappointed when the powerful lenses showed him a distant, conical hill, topped with an intermittent glow and a plume of ruddy smoke. A volcano.

But it had, at least, served its purpose insofar as it had warned him that *Martian Maid* was driving fast on to a lee shore. And he was helpless. In a surface ship of his own time, engineless hulk though she may have been, he could, as a last resort, have let go his anchors and hung on like grim death. For frantic moments his mind played with the possibility of making some heavy weight fast to the end of the parachute lines, of thus converting his sea anchor into a sheet anchor. Sure, it was a fine idea. But how was he going to get it there?

"Any of those flares saved from the control room?"

"Yes," replied the cadet. "The locker was burst open and they floated up."

"Are they watertight?"

"Why, yes." There was a certain puzzlement in the lad's voice. Surely the second pilot should have been able to *tell* him things.

"Good. Nip down and grab a couple, will you?"

"I have two here, sir."

"Better still. Thanks. Let's see; how do I—?"

"Just pull the cap off, sir."

As Whitley pulled he thought, *"Thank God that's something they haven't made needlessly complicated."* The flare fizzed briefly, burst into sudden, blinding life in his hand. With a purely reflex action he cast it from him. The wind took it, and it must have sailed for fully half a mile before it fell into the water.

At first there was no improvement in conditions as far as an efficient lookout was concerned. The intense blue-white light, rising and falling on the wave crests, dazzled rather than aided, was even more of a hindrance than the lightning had been.

But the flare was subject to surface drift only. The ship, pushed before that terrific wind, was making appreciable way through the water. In a surprisingly short space of time she overhauled the light, and then she was down wind from its steady glare.

And less than a mile distant Whitley saw great columns of spray rise high in the air where the shouting seas drove to destruction on a long, low line of jagged black rocks.

The stranding, when it came, was surprisingly gentle. *Martian Maid* lifted on the crest of a sea that almost justified the hyperbole "mountainous," and for long seconds hung over the reef. It seemed that she must clear it, must ride the storm into the calmer water beyond. But from forward came the dreadful grating of metal on rock, the screaming of tortured plates and girders. The huge sea passed on in a welter of white water. And when it was gone the ship did not fall into the trough but lay with almost her full length exposed.

"We should be safe," shouted Leonora, "until morning!"

"We aren't!" bellowed Whitley.

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"This sea will soon pound us to pieces. And if we slip off the rocks we're done for. She must be holed for'ard!"

'What do we do about it?"

"Abandon ship!"

"All right for those of us who can swim well. But these second- and third-generation Martian colonists— They always regard water as something far too precious to splash around in!"

"Nobody mentioned swimming!"

"A raft?"

"No!" Then he turned to the cadet who had been standing by waiting for orders. "Stanley! What's the breaking strain of those drums of fine wire among the cargo?"

"I don't know, sir, but it's M.M.C. cargo. Mr. Haydon is a mining engineer. He should know!"

"Ask him to report up here, will you?"

After a long interval the Martian clambered up among the wreckage of the engine room. By the light of the fresh flare that Whitley had just lit he looked badly frightened. He *was* frightened, and didn't care who knew it. Mars was never like this.

"I'm Haydon," he said. "What do you want?"

"Those drums of wire—I take it that they're consigned to your concern?"

"Yes."

"What's the breaking strain?"

"Can't say for sure. About a hundred tons."

"A hundred tons?" gasped Whitley. "Did you say a *hundred?*"

"Yes. What did you expect? A thousand?"

The other ignored the crack. He was trying to adjust his mind to the fact that wire rope of about the size and texture of boat lacing was stronger than the heaviest hawsers with which he had had dealings in his own time. This was better than he had expected. He toyed with the idea of working on an endless whip alone—but at a distance of close on a quarter mile—so he estimated the distance from the beach—there would be far too much catenary.

"Stanley! Organize a working party. If Mr. Pawson or Mr. Jenkins are in circulation yet ask them to come up here. And I want one, maybe two, of those drums of wire. And some of those blocks. And a differential purchase."

"What are you going to do, Dale?"

"A breeches buoy, Leo. You see that tree," he pointed to something like an oversized feather duster on top of a low cliff, "somebody will have to swim ashore with an end of this wire and make it fast to it. Then we set it up tight aboard the ship with a purchase. But you'll see it all done!"

"I shan't!"

"Why not?"

"Because I'm the one who's swimming ashore!

"Listen, George," she drew him further into the lee of the twisted tail fin where it was comparatively quiet and she did not have to shout, "please forget all your archaic ideas of chivalry. They're very sweet,

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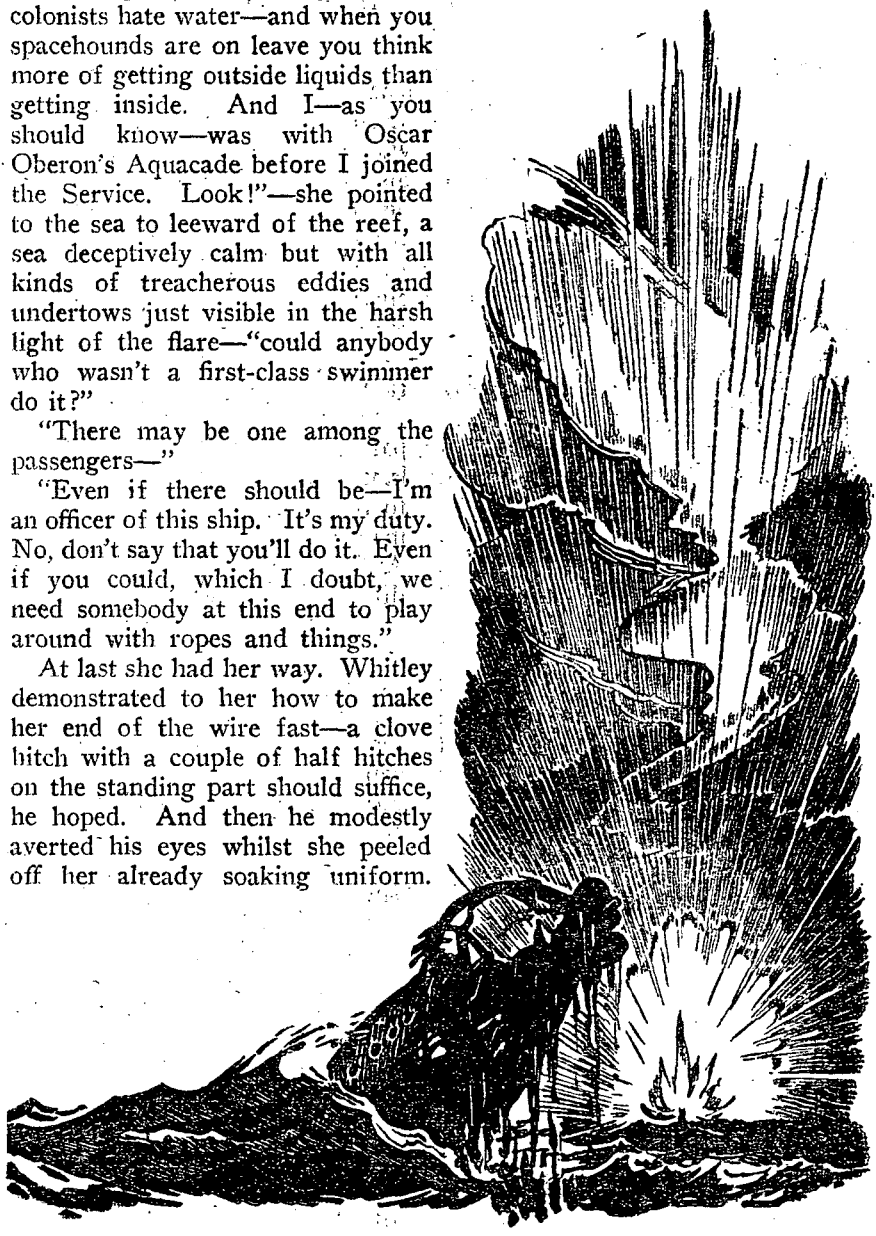
I know, but in this case they just aren't practicable. I'm the only person here qualified for the job. The colonists hate water—and when you spacehounds are on leave you think more of getting outside liquids than getting inside. And I—as you should know—was with Oscar Oberon's Aquacade before I joined the Service. Look!"—she pointed to the sea to leeward of the reef, a sea deceptively calm but with all kinds of treacherous eddies and undertows just visible in the harsh light of the flare—"could anybody who wasn't a first-class swimmer do it?"

"There may be one among the passengers—"

"Even if there should be—I'm an officer of this ship. It's my duty. No, don't say that you'll do it. Even if you could, which I doubt, we need somebody at this end to play around with ropes and things."

At last she had her way. Whitley demonstrated to her how to make her end of the wire fast—a clove hitch with a couple of half hitches on the standing part should suffice, he hoped. And then he modestly averted his eyes whilst she peeled off her already soaking uniform.



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His face was crimson when he had to make the line fast around her waist. He managed to force his fumbling fingers through the simple intricacies of a running bowline, then paused. "This will cut you in two," he said. His eye fell on her discarded uniform. The tunic boasted a broad belt of apparently tough fabric. He took this, buckled it around her in lieu of the wire, made the wire fast round the belt. Still embarrassed, he made sure that it would not slip down over her hips. But if—and this is doubtful—her figure had any faults it was on the side of fullness.

He took two of the flares, made them fast to the belt with odd lengths of the wire.

"You understand," he said. "When you get to the beach, set off one of the flares. When you get your end fast, set off the other."

"I understand."

And then briefly, she was in his arms. The kiss was short, satisfying—and yet unsatisfying.

"Just in case—" she said.

For a fleeting moment she stood poised in the light of the flare, still burning where it had been wedged among the wreckage. And with her going the night seemed very much darker.

It was a beautifully clean dive she made, one that proved conclusively that her claim to aquatic prowess had not been idle boasting. Whitley lived through centuries before the golden head reappeared on the turbulent surface. He would not let anybody else handle the wire. Fortunately, it came on its drum ready for use—whatever its use may have been. There was even a brake. He paid out with the utmost care. Too little slack and the weight of the wire would pull Leonora back, would drag her away from the shore where lay both her safety and that of every soul on board. Too much slack—and the bight would foul whatever obstructions might be on the bottom. And unless she could cast the end loose from her belt she would be doomed.

Stanley stood by his side, his glasses trained on the head of the swimmer. Unconscious of the effect on Whitley he began a running commentary. "She's going ahead fast, sir. She's stopped. She's down. She's up again."

"For the love of Mike, shut up!" barked his superior. "If you must make a noise, let me know when she's got there!" One hand on the brake, one on the wire itself, he paid out. He began to wonder if the one drum would be enough. Then Stanley shouted: "She's made it!"

Hard on the heels of his cry the flare wedged in the wreckage guttered and died. But from the shore came a light, intensely bright even at this distance. Whitley straightened up, seized the prismatics from the other's hands. At first he could see nothing for the glare from the beach. Then he shifted his line of sight slightly so that the flare was just outside the field of his glasses. And he saw a figure, whitely luminous in that blazing radiance, staggering up and across the black sand

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to the low cliff. Once she fell, and lay long seconds before she recovered. He felt that he got her to her feet again by his own concentrated will power. And then, at last, she was clambering up towards the tree. He saw her there, fumbling awhile. Abruptly she dropped to the sand. And then the second flare drove back the rushing, wind-borne shadows to the limit of vision.

Now that he was no longer concerned about the girl's safety, Whitley—in a perverse sort of way—was beginning to enjoy himself. This—even though it was an alien planet—was his world. He was no longer a mere, uniformed passenger obliged to grapple with problems beyond his comprehension. The fact that, so far, he had grappled with those same problems with success he dismissed as blind luck. But now he was dealing with forces and problems that he knew of old.

The end of the wire remaining aboard the ship was taken through a block made fast to the upper extremity of the twisted tail fin. He had all hands that he could muster in the confined space tail on to it, but their combined efforts could not lift the bight far clear of the water. More blocks and tackle were brought up from below, and with their aid the span was set up reasonably taut.

Among the blocks was one of the variety known as a snatch block in his own time. This he slipped over the bight of the wire, so that it ran along the span as on a rail. A cradle was rigged hanging below this. Meanwhile, an endless whip had been prepared, one of the Martian mining engineers having proved himself adept at splicing and handling the tackle used in his profession. All that remained was to get one of the blocks ashore and make it fast just below the span.

It was Stanley who volunteered for the task. Whitley would have gone—not so much because he doubted the lad's ability to handle the job but because, now that the immediate pressure of work had subsided, he felt that he should be with Leonora. But it was essential that he stay with the ship until the end.

It had been assumed that Stanley, seated in his cradle, would have to pull himself hand over hand along the wire until he reached comparative safety. But once out of the lee of the ship the wind took him, and those aboard had to slack out the endless whip with caution lest he be dashed against the low cliff at the shore end. But he made it, and the light of yet another flare proclaimed that his block was fast.

All that now remained was to set up the second block at the ship end. This was soon accomplished, and then Whitley had at his disposal what was, in effect, a transporter bridge from ship shore. In his own time it had been called a breeches buoy.

Standing on his parody of a quarter-deck he almost gave an absurd order, but checked himself in time. "Women and children first" was a rule sanctified by long centuries of precedent on Earth—but on

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Earth one could count on friendly, humane hands to receive castaways. But on Venus—

"Anybody here who knows how to use those guns in the cargo?" he demanded. Then—"Mr. Jenkins! Slip below and see if there's anyone there who can use 'em!"

"They're M.F.C.—Martian Fur Corporation—cargo," volunteered Pawson. "There are two or three professional hunters among the passengers. Pawson will find them and get them up here."

"Good."

Soon the hunters were standing on the wind-swept deck. Little men they were, with keen, long-sighted eyes. Brave men they undoubtedly were when facing the hazards of their own trade. But just now they were badly shaken.

But with a courage far greater than they had ever shown whilst hunting the savage, fur-bearing beasts of Mars they intrusted themselves to Whitley's outlandish contraption of wire and pulleys, allowed themselves to be swung out over the black water in the extemporized cradle—it had been one of the chairs in the lounge—clutching their weapons tightly, the one familiar thing in this wild, wet world. "Shoot at sight," Whitley had told them. "If anything, *anything,* shows up—let fly. Remember, I'm relying on you to keep the shore end clear for me."

Before the cradle swung in to where young Stanley was waiting to assist them to solid earth they were peering up and down the beach, thankful for orders that they could understand.

Once passengers and crew got the hang of things the work went with surprising smoothness. Dreading a shift of wind, Whitley had to work out a system of priorities. Had this been Earth, all that mattered would have been to get all hands ashore in one piece—but here he had to consider the rival claims of food, arms, equipment of all sorts. It would have been absurd to have landed with no immediate loss of life but with nothing to eat and no means either of self-defense or hunting whatever edible fauna, if any, were to be found.

The departmental heads made things no easier. Had the surgeon had his way the party would have been well able to set up shop as pharmaceutists. They would have had ample resources for the alleviation of the pangs of indigestion—but nothing whatsoever to cause it. On the other hand Miss Emerson, the buxom, bustling catering officer, was too prone to put creature comfort before all else. Be that as it may, she and her two hostesses and the huge, temperamental negress who was her cook performed prodigies of sheer, unrelieved muling. Whenever Whitley thought that it was time to send ashore a load of foodstuffs or blankets instead of ammunition or human freight it was always ready and waiting.

The wind now was unsteady and gusty, backing and veering as much as four points. There was, of

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course, no break in the sky, but it was obvious that some change in the weather would soon be upon them. At times there would be almost a flat calm, and then a shrieking rain squall would be upon them to fill the air with a torrential downpour from above mingled with spindrift torn from the tortured surface of the sea. On these occasions the lightning would make their flares seem as but tallow candles, whilst the deafening thunder would make conversation impossible for minutes after the squall had passed.

As she was, *Martian Maid* was held immovably on the reef by the sheer weight of wind and sea. But should the wind back or veer to the opposite quarter she would slide off into the deep water outside the shoal, taking with her all on board.

When the lull came Whitley was not unprepared. He had discharged his ship strategically, something of everything. True, he didn't have nearly enough of anything, but the party should be able to meet almost any emergency.

He watched the last sling of food go swinging ashore, pulled by the now sizable working party on the beach, then climbed up on to the tail fin to see what he could of the weather conditions.

The wind had fallen, but the sea was not calm. It had become an ugly, confused, pyramidal swell. And from seaward came a low but increasingly distinct roar as the rear semicircle of the atmospheric vortex approached at a speed he had no means of estimating.

He climbed down from the fin.

"Abandon ship," he said.

The cradle had returned, and on to it he loaded Miss Emerson and one of her hostesses, hanging around them bundles of all manner of gear. He waved—Pawson on the beach could see the signal distinctly through his M.F.C. prismatics—and the load swung shorewoods. Next it was the turn of the other hostess and the cook. Whitley saw that tears were streaming down the negress' face as he helped to lash her securely. "It's hard, Mr. Dale," she said in a surprisingly cultured voice, "to leave this ship."

"Cheer up, Amelia," he said, patting her back. "We have to leave before she leaves us. And it won't be long."

It was Saunders who almost finished the adventure for Whitley. Somehow, although useless in the work because of his still bandaged eyes, he had managed to evade being sent ashore. Whitley was unaware of his presence until he himself was about to take his seat in the cradle. Then—

"Number One! What are *you* doing here? Let me put you in the cradle."

"No, Dale. I'm staying. I'm master of this ship. And I'm going down with her."

"Don't be a bloody fool!" Dale swung himself down from the chair, made to grab the other's arm. Saunders swung blindly, instinctively, and by sheer chance the blow connected. Whitley never knew for how long he was out, but when he came round the chief pilot, who

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had torn the bandage from his watering eyes, was striving with inexpert, clumsy fingers to lash him into the cradle. The shift of wind had come, and a fitful, gusty breeze was already blowing from the land. *Martian Maid,* until now as steady as the rocks on which she had grounded, was becoming uneasy. Tremors ran through her hull, each one accompanied by a chorus of increasingly loud gratings and groanings from below decks. There was no time to lose.

Whitley swung his foot, viciously, catching Saunders full on the point of the jaw. It was the work of seconds to release himself from the other's bungled bends and hitches, to drag the bulky, inert form to the cradle. Getting him up into the chair took longer. By the time Saunders had been well secured the wind had steadied in direction, was rapidly approaching gale force.

Whitley threw a couple of hasty turns around himself, then signaled to the shore. Slowly, for those at the other end were pulling against the wind, the cradle swung out and away from the ship, over the black water that was fast being lashed to fresh turbulence.

Midway, the progress made was almost negligible. The wire above their heads was bar taut, and drumming with the enormous strain now put upon it. It seemed probable that it was holding the ship on to the reef in the teeth of the hurricane. Whitley found himself thinking that the tree to which the other end was made fast must be enormously tough.

The flare that he had left wedged among the wreckage was torn from its position and blown to seaward. He could see the ship in black silhouette against the glare of the floating light—looming huge and fantastic like a medieval castle against an impossible dawn. Then she was gone, and only the flare, poised high on the crest of a sea, could be seen. Seconds later the cradle, held on the end of its line almost horizontally by the screaming gale, fell. Saunders was still unconscious and Whitley was hampered by the lashings he had thrown about them both.

"They're determined to drown me," was his last conscious thought.

When he came round it was some time before he was able to place himself. It was dark, very dark, but now and again somebody would flash a pocket torch. There was the noise of wind, too, but it was somehow muffled.

"He's coming round," he heard someone say.

Then Leonora was bending over him.

"It's a horribly conventional question," he said, "but where am I?"

"In a cave," she replied. "We'd almost got you and Mr. Saunders in, then the fastenings of the pulley" —Whitley winced a little—"on the tail fin came . . . er . . . unfastened. So we pulled you both in. You hadn't got much water in you, but you'd managed to get a bang on the head from somewhere."

"So it seems. But this cave?"

"It's just under the tree we used.

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Two of the hunters went in first in case there were any wild animals. There were—or was—one. A big thing like a crocodile. They shot it."

"Any sign of dawn yet?"

"No, as dark as ever. And the wind's bad—"

"It must get light some time. A revolving storm should mean a planet with some axial rotation. And if this were a permanent dark side it wouldn't be so hot. But I'm going outside."

Leonora helped him up. He was glad of her assistance, being weaker than he had anticipated. Guided by her pocket flash they picked their way through the castaways, huddled in random, dejected groups all over the floor of the cave. Whitley was not surprised to find that the entrance to the cavern belied the cathedral vastness of the interior. Had it been in keeping he must surely have spotted it from the ship.

And then they were standing in the gusty darkness at the foot of the cliff. The sailor took the little torch and flashed it around.

"What, no watch?" he demanded angrily. "Anything might creep upon us. And we don't know what the tides are like here. Stanley!" he bawled.

The little cadet must have been among those not sleeping. In a few seconds he was by Whitley's side. "Call the other officers," he was told. "Tell them I want them at once. And get one of those Martian hunters and have him keep a look-out in the entrance with one or two of those flares and his gun handy. I'm surprised that they didn't think of that without being told."

The lad vanished back into the cave. Whitley couldn't see Leonora, but the expression in her voice told him that her eyebrows must be raised. "Quite the little Hitler," she said. "Everybody needs rest after what they've been through."

"Of course they do. And if I don't succeed in stirring up some kind of watch on deck it'll be their last rest! Listen!"—he grasped her arm roughly—"you people have had far too soft a life. You just can't conceive that anything or anybody could possibly have any animosity against you. Your world is far too safe, too peaceful. It's better than mine—but there we knew that all kinds of animals, two- as well as four-legged, were ready and willing to do the dirty on us. We may have temporarily outwitted the insensate forces of Nature, but we still have whatever life this world boasts to deal with." He became aware that somebody was standing at their side. "Who's that?" he demanded.

"Taberner, skipper. And, though I say it who shouldn't, the best shot on the books of the M.F.C."

"Good. I want you to keep out here until you're relieved. If you hear or see the slightest sign of movement loose off a flare—I suppose Stanley gave you one—and let fly. Got it?"

"Yes, skipper." The man seemed

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relieved to have a job, to have somebody who would give him orders.

Whitley and the girl went back into the cave. Stanley's torch flitting here and there like a will-o'-the-wisp showed that he was finding and calling the officers. The thick darkness made the task no easy one. *"In all the books about shipwrecks he had ever read,"* thought Whitley, *"the castaways started off by building a fire. Not that, in this case, its warmth would be necessary, but it would give light and a certain cheerfulness."*

The almost dry debris entangling his feet made him think that a fire might be practical politics. A definite current of air from the mouth to the back of the cave showed that there must be ventilation of a sort, that smoke disposal would not be too serious a problem. For matches— In his own time he could have been sure of some means of starting a fire—pocket lighter or otherwise. But in this age of self-igniting cigarettes which just refused to ignite in the humid Venusian atmosphere—there was nothing.

Taking the little torch he squatted down and examined the decaying vegetation with which the cave was carpeted. It did not appear to be seaweed—a welcome sign—and was comparatively dry. How it had got there he could not say—it may have been brought in by previous occupants. He gathered an armful and carried it to the rear. A few more journeys, aided by Leonora, and there was a respectable pile. One of the invaluable flares thrust into the heap achieved results. Its fierce heat soon dried the fuel—and soon a cheerful blaze filled the gloomy cavern with dancing lights and shadows.

Some of the sleepers murmured and stirred, but most of them slept on.

Whitley sat by the fire in his steaming clothes, waiting for the others to report to him and watching the acrid smoke stream almost straight up to the high, crannied roof. By his side Leonora spread the contents of her cigarette case on the floor to dry. "This makes a difference," she said. "Wonder if we should have one outside, too."

"Can't decide. If I could be sure that it would scare things off I'd give it a go—but it might attract unwelcome attention. Ah, here's the doctor. Sit down and make yourself at home."

When the officers of all departments were gathered the conference was opened. It may well be that "conference" is a misleading word. It was more of a lecture on the correct procedure in the event of shipwreck. Watches were set, both for the cave entrance and the fire. Flares were not sufficiently plentiful to justify the expenditure of one every time the fire required relighting. A rationing system was worked out. And when at last, things were more or less shipshape Whitley allowed himself the luxury of a rest. He made himself a bed on the hard rock with a couple of blankets, sleepily told Pawson, who was officer of the first watch, to give

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him a shout in the event of daylight, a change of weather or any emergency, then dropped into a dreamless and almost instantaneous sleep. He thought dreamily that he should have given orders to be called at some set time.

Things usually come in threes. The first of the three was the change in the weather. Whitley did not awake with his usual swift transition from sleep to complete awareness when Jenkins called him. He felt like a corpse warmed up—warmed almost to the point of cooking. In his mouth was a dark brown taste and in his nostrils an unpleasant odor compounded of acrid smoke and what they were all to come to regard as the characteristic stink of Venus—a miasma of moist corruption.

He made an effort and creaked to his feet.

"Yes, Jenkins?"

"The wind, Dale. It's dropped."

"Good."

Guided by the other's flash he picked his way through the sleepers. Outside the cave mouth it was calm—with a stagnant airlessness. Down on the beach the swell rolled rhythmically on to the shelving sand, visible as a line of luminescence in the darkness as the seas curled over and broke. Further to seaward the reef shot fountains of living light into the black sky. Something big broke the surface and flopped back again with a loud splash, to be outlined briefly and unsatisfyingly with pale fire.

"Now what?" thought Whitley. *"Now what?"* He had a theory that on a planet with a slow axial rotation such as Venus apparently had all kinds of atmospheric disturbances could be expected along the line of demarcation between day and night. If this were the case, dawn could not be far off. But that, as the monkey said, remained to be seen.

He became aware that all kinds of people, passengers as well as his fellow officers, were around him. They had obviously awaited his awakening to ask questions and air grievances. But he was in no mood for this. He wanted to be alone to try and get things straight.

"I wonder if you could show me how that gun of yours works," he said to the hunter whose turn of sentry duty it was. The Martian demonstrated. It was not so very different from the automatic weapons of the twentieth century. There was a box magazine, and there was a lever which, in accordance with the position into which it was put, acted as a safety catch or gave single shot or full automatic fire. The weapon itself could be fired either from the shoulder or as a tommy gun.

"I'll take this," said Whitley. "You can get yourself another one from inside the cave." He had no intention of setting an even worse example than that which he was already setting by wandering off alone *and* unarmed.

But he was not to be alone. He became aware that somebody had fallen in beside him. Rudely, he swung the beam of the torch he had

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requisitioned full in the other's face. He was neither surprised nor sorry to see that it was Leonora.

"Do you mind?" she said.

"No." Then, more graciously, "I'm glad you have come, my dear."

"Where are we going?"

"Just somewhere where we can be away from the mob. I've got to get things straight with myself. Now that the excitement's over I've got that let-down sort of feeling. I'm wondering if perhaps I shouldn't hand over to Saunders—after all, he *is* the senior surviving officer. As for me—if I'm me I'm just an outsider, and if I'm Dale I'm just an upstart puppy of a junior."

"Don't be a fool." Her voice was intense. "You've got them all eating out of your hand now. And, if you want an honest opinion, I don't think that anybody else, officer or passenger, could handle things. This is all as strange to us as it is to you. Stranger. Being wrecked on desert islands must have been a commonplace experience in your time."

"It was not. But shall we sit down? I'm tired of tripping over things and slipping."

By the light of their torches they found a smooth, flat-topped rock, standing up solitary from the black sand. By some minor miracle it was not covered with slimy algae, nor did it boast any gelatinous blobs that could have been *anything*. It may have been uncovered by the storm only a few hours previously.

On this they sat, not talking much, yet each deriving more than a little comfort from the close proximity of the other. Behind them was the cave, a hardy visible circle of dim, flickering light. Before them was the dark, mysterious sea.

As they watched, a slow change come over its face. First it seemed that the phosphorescence along the beach and the reef became more intense, and then this same phosphorescence seemed to shoot streamers of pallid moonlight into the surrounding water. These intermingled and coalesced, putting out yet more sprays and branches of pulsating flame. And as the living light swirled and spread color came, faint at first as a Lunar rainbow and then deepening until the sea, from the dark shore to the furthest horizon, was one chromatic glory. The low overcast shone with reflected crimson and azure, jade and amethyst.

"Like a dream in technicolor," said Whitley, as though to dispel the fascination of the scene by the cheapness of his humor. It was so uncannily beautiful that it frightened him.

Suddenly he tensed, stared hard at a point between the shoals and the beach. Leonora heard the faint, sharp clicks as he moved the catch of his weapon from *Safety* to *Automatic*. "Look!" he said pointing.

She followed his arm, black in silhouette against the radiance from the sea. At first she could see nothing, and then straining her eyes, she could make out a moving, oddly symmetrical patch of fainter light against the background of brightly luminous water. It dawned on her

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suddenly that the object, whatever it was, was shining by reflection only.

It came to a stop when it was almost abreast of the mouth of the cave. Then there was a sharp twang, as of a suddenly released bowstring, to be followed by a crash and a rattle of falling rubble. The murmur of voices that had been coming from the entrance—for almost everybody must have turned out to witness the shining sea—abruptly ceased, was replaced by shouts and screams.

"What are they waiting for?" shouted Whitley.

He saw a line of faint, vague shapes in the water surging shoreward from what he had, by now, decided was a ship. There was another almost musical twang, followed by another heavy impact against the cliff face. Somewhere, loud, insistent, a little drum started beating with an odd, broken rhythm. It seemed almost like code. It probably was code.

But Whitley was not listening to the drum. He remembered it afterwards, remembered how the rattling song of his gun had blended with and finally drowned that of the other. But now all his conscious attention was focused on the sweeping flight of his little rocket projectiles—like the old, familiar tracers they were—as he hosepiped them upon the swimmers. He heard hoarse, croaking cries, saw the line of attackers dwindle and falter.

A bolt from the weapon aboard the ship hurtled past, almost knocking him and the girl flat with the wind of its passing. It buried itself with a dull, sodden thud in the wet sand. Whitley shifted his fire from the surf to the dim, scarce visible outline of the ship. The Venusian gunners must either have been killed or driven under cover, for their weapon was not fired again during the course of the action.

Then, at last, a flare flamed into sudden, incandescent life by the cave mouth. In its hard, merciless glare the figures of the attackers could be seen. Like men they were—or like frogs. Like something out of a cartoon film by an evil, pervert Disney. The first line—or what was left of it—was already out of the water. Waving vicious, glittering knives they charged up the beach. Whitley's fire took them in the flank, and from the cave three or more guns burst into stammering song. Of this first wave only one of the Venusians won to within a hundred feet of the defenders. And he collapsed suddenly, literally torn to pieces by the concentrated fire.

A second wave met the fate of the first—then a third. There were no more.

Still the cave gunners kept up their fire, raking the ship from stem to stern.

"Cease fire!" bawled Whitley. Then—"Come on! We must stop those fools before it's too late!"

"What's the hurry?"

"Plenty. They're wasting ammunition for a start. And I've got a ship, a *ship!* And I don't want her blown full of holes!"

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In less than an hour after the attack the first, faint flush of dawn was visible to seaward. With surprising rapidity a dismal, wan daylight spread over sea and sky. Before it was properly light the spectacular phosphorescence of the sea abruptly went out—almost as though some unseen hand had pulled a master switch.

Whitley was pleased to see the light. He was having to burn flare after flare to keep the ship under observation. She was obviously lying to some kind of anchor and he did not want the survivors of the crew either to heave up at leisure or slip the cable and escape. And he did not want to launch his attack on the attackers until it was properly light. For there had already been casualties among the castaways. The sentry who had been on duty when the Venusians opened fire had been cut in two by the missile—a shaft about ten feet long, it was, with long, razor-sharp blades projecting out from the head. And—this was hard to take—two of the children had been killed by the second round.

"*Four already,*" thought Whitley as he paced the ledge in front of the cave. "*Four out of sixty-four. And if we attack in the dark any survivors skulking aboard the ship will fight like cornered rats. And we shall lose more. She'll keep till daylight.*"

To add to his worries a distant drum started to beat from what the coming of dawn identified as the nor'ard. It seemed to be some kind of code—and it seemed to have a questioning note. It seemed that somebody, somewhere, was trying to get in touch with the attacking party. After a while the disquieting sound ceased.

And then the dawn came.

The increasing light was the signal to Whitley that he must set his

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schemes for seizing the ship in motion. The end of the night meant other things too, entailed a task that he would have found most distasteful.

"But I can't," he told Leonora. "I have no right to. Don't forget that I'm not one of you."

"Perhaps you're right. Saunders will have to."

Somebody had gone down to the beach and collected the broad-bladed knives from the dead Venusians. Somebody else had found some flat pieces of driftwood. During the night the parachute had been washed ashore. From it lengths of the heavy silk were hacked to serve as shrouds.

Whitley looked from the three muffled figures—two of them pitifully small—to where a working party was scratching away with improvised tools at three trenches. *"Be honest,"* he told himself, *"call them graves. And the last one of us left alive will have nobody to bury him."* His morbid mood was accentuated by the sullen, yellow sky overhanging the sullen, yellow sea.

"Just part of the price," whispered Leonora at his elbow. "Just part of the price. And no matter who goes next, no matter if we all go, it's worth it! Can't you see? It's worth it!"

"Yes," he replied slowly, "perhaps it is. Do you read Kipling? Before your time, I'm afraid. But this is what he said:

"'If blood be the price of Admiralty,
Lord God, we ha' paid in full—'

But they're taking them down to the beach—"

It was Saunders, standing by himself, who recited the brief Burial Service from memory. On the other side of the grave were gathered the rest of the party—the parents of the dead children, the mate of the hunter, officers and passengers.

The chief pilot, his full face strained and solemn, reached the conclusion of his speech. "And so we commit the bodies of our brothers and sisters to"—he hesitated, groping for words more suitable than those of the official form—"the soil of an alien planet. We—" His voice trailed off into a horrible gurgle. His hands went up to clutch at his throat, from which protruded a vaned, metal shaft about nine inches in length. From the cave mouth came the frenzied chattering of the automatic rifle of the sentry on duty. The little rocket projectiles hissed and whined over the heads of the burial party. Other bolts came from the ship, but the aim of the unseen marksmen was spoiled by the fire from the cave.

Whitley caught Leonora Starr a swinging blow that knocked her flat on her face. "Down!" he bellowed. "Down, if you value your lives!"

Most of the others heeded his warning, but two of the men made a mad dash for the safety of the cavern. Before they were halfway there the Venusian bowmen—who had by now recovered their steadiness of aim—picked them off. The

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riflemen with the burial party tried to return the fire from a prone position. But they had no cover and dared not raise themselves sufficiently to take proper aim, whilst their opponents were firing through tiny ports and from behind many inches of tough wood.

On the fore deck of the ship appeared a cautious, crouching figure. It ran to where the anchor cable was led over some kind of windlass—doubtless with the intention of cutting or slipping so that the ship could drift to safety in the strong current. Here, at last, was something for the gunners to fire at. The grotesque, unhuman figure collapsed, literally torn to shreds.

"*This won't do,*" thought Whitley. His mind, active once more, raced from plan to possibility, desperately sought some way out of the impasse. Much as he disliked the idea—for he was essentially a peace-loving soul who believed that the only gentlemanly way to fight a naval battle was at long range with big guns—a piratical boarding party was the only solution. He passed word round of his intentions. Reluctantly, he began to shrug himself out of his uniform, retaining only the belt, through which he thrust one of the Venusian knives. About a dozen of the men followed his example. He was glad that Leonora was busy with the casualties of this latest attack—although it is probable that she was running more risk than he would do. It is impossible to administer to an injured person from a prone position—and even though she was very careful not to stand upright she was a target.

A last, obvious thought struck Whitley as he edged his way down to the water's edge.

"Foxholes!" he shouted. Then —"Scrape yourselves trenches in the sand for cover!"

The sea, when he reached it, was stickily warm. He splashed through the shallows, trying to keep his body down. An occasional vicious splash too close for comfort showed that he was under fire from the ship. Over his head sang the covering fire from beach and cave. He tried, unsuccessfully, to ignore the missiles from both parties. He wondered where the rest of the attackers had got to, and then loud floundering noises from the rear showed that he was being followed.

He was never an expert swimmer and his amateurish breast stroke was painfully slow. From water level the ship looked huge—as big, almost, as one of the floating cities of his own time—yet distant. It seemed that he would never make it, that the strong current would sweep him down past the southern extremity of the reef. He tired, and tried swimming on his back. The blade thrust between belt and skin chafed him badly, inflicted several nasty little cuts on hip and leg. It was too easy to remember how the sharks of the seas of Earth are attracted by fresh blood, and hard indeed to refrain from a frantic, energy-wasting burst of speed.

When he turned over, the ship, looking much smaller, was close. He realized that for some time there

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had been no fire from the Venusians, assumed that from their positions they could not bring their weapons down to bear on anything at close range on the surface. That would make things very much easier.

The boarding party had reached the ship by her counter stern. There was no possibility of climbing aboard there—even if the hull had not been so slimy as to afford no grip, the overhang must, inevitably, have defeated any such attempt. Whitley hung for a while to the rudder to recover his wind. Around him the others trod water and looked longingly at the resting place he had monopolized. He could sympathize with them—but he had no intention of shifting until he had got his wind back. Then—

"We'll have to make it for'ard," he said. "By the cable. They seem to have no ladders over."

As quietly as possible the boarding party swam along the green, slimy side of the ship. Whitley was first to come to the anchor cable. It was not of metal chain but was apparently made of some vegetable fiber closely resembling coir. Like all else about the vessel it was thickly coated with algae, but the roughness of the rope afforded a grip in spite of this.

It was taut, but not bar taut, and made an angle of about thirty degrees with the surface of the water. Luckily it did not come down through a hawsepipe but through a fairlead in the low bulwarks. Though he had never claimed to be a gymnast the sailor thought that he could negotiate it without much difficulty. What he might have to face once he got aboard he preferred not to think about.

Hand over hand he went up the cable. It was easy whilst the water still supported the weight of the lower part of his body, but when he was clear of the sea Whitley had to throw his legs around the rope. Still, he went up it with reasonable alacrity. When his hands butted against the planking he swung himself round, hung for a moment in his prone position, and then clutched at the rail. He hoped that nobody was waiting with a sharp knife. A burst of enthusiastic fire from the shore showed that somebody might have toyed with the idea but had been effectively discouraged.

He looked down. Below him, like some smooth, hairless sloth, Stanley was hanging to the cable. Below *him* was Taberner, the little hunter. He grinned down at them.

"It's over the top now," he almost whispered. "Once I'm up the rest of you follow as fast as you can."

A quick, muscle-cracking heave and he stood on deck. His bare feet scrambled madly for purchase and for a few frantic seconds he executed a mad fandango on the slimy surface, finally falling with a bone-shaking crash. It was as well that he did; had he remained erect he would have stopped the bolt loosed from the shelter of the deckhouse. On his back—the deck had

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a pronounced sheer—he slid aft, and before the Venusian could reload and fire the Earthman was upon him.

Stanley and Taberner, coming aboard a few seconds later, saw a mad tangle of flailing arms and legs among which two knives flashed and waved. It was almost impossible to tell one combatant from the other, so thickly was Whitley coated with the green slime. A little to one side stood another of the Venusians making cautious, half-hearted jabs with a long spear. He was hampered by his fear of doing his shipmate an injury and contributed nothing to the outcome of the battle.

Like Whitley, the cadet and the hunter slipped and staggered. But they succeeded in keeping their feet. Like schoolboys on a slide they slithered aft. They were upon the second Venusian before he fully realized what was happening, although he did make an almost successful attempt to bring his spear up to the ready. But the long-hafted weapon was thrust to one side, and one knife split his skull whilst the other buried itself in his body.

There was a stout door to the deckhouse entrance. This Stanley slammed. He wanted to make sure that the odds remained on the side of the boarding party for this little struggle at least. It did not occur to him until later that he was giving any surviving crew members an opportunity of barricading themselves in.

Taberner hovered above the fight, poised on the balls of his feet, his knife ready.

"I wish they'd keep still for a moment!" he grumbled.

"You try it!" came a strangled gasp from the squirming mess. "But you'd better do something—and do it quick!"

"Disarm them both," suggested Stanley. He looked forward. "Here come the others. Get both their knives away and then we can disentangle them. It will help, perhaps, if we get a prisoner."

But Whitley, fighting for his life, wasn't interested in such purely academic details. He knew that he could not hope to last much longer, that the instant his guard was down the other's knife would sweep or thrust once—and once only. He found it increasingly difficult to keep his grip on the slippery skin. And, even in danger of his life, he found time to feel the utmost horror and revulsion for the slimy body pressed against his, for the rank, swamp odor of the thing. And those two bloody fools talked about taking prisoners!

Then he heard Taberner talking in a low, intent voice. "Relax, skipper! Let him get you down! It's the only way!"

It was hard to allow himself to yield to his unhuman enemy. It was hard to let his knife hand be forced back, to feel himself pressed down by the noisome weight till his back was flat on the slimy deck. And yet it was an infinite relief to be able to stop struggling, to put the whole business in another's hands. Nevertheless, he did not

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relinquish his grip on the Venusian's knife hand. He trusted Taberner—but not that much.

But if the native could not use his knife he had other weapons. The hideous, reptilian head was brought down, and down, and down. The wide mouth opened, revealing two serrated rows of needle-sharp teeth. The eyes shone with a naked savagery that sickened Whitley to the core. Ignoring all that had gone before, he knew with the utmost certainty that no peace would ever be possible with these people.

Then Taberner's knife flashed once. The grinning head rolled off the green shoulders, striking Whitley's face as it fell. The body on top of him started to jerk and twitch—and went on jerking and twitching. The sailor rolled from under the convulsed carcass. Staggering and slipping, he ran for the side. For minutes he hung over the low rail. When he had finished he stood erect wearily. He looked around. Save for Stanley the deck was deserted.

"Where are the others?" he demanded.

"Gone below, Mr. Dale. Mr. Taberner told me to stay up here with you." The youth was plainly disgusted at having to miss whatever further excitement might be in store. "He—"

"Never mind that now. We're going after them."

But as they started the descent of the ladder just inside the deckhouse door Taberner shouted to them, "Two more! And that's the lot!"

From the north came the staccato, questioning music of a distant drum.

For one in his predicament George Whitley was a surprisingly happy man. He had a ship. He did not know how many hours of daylight remained to him before the coming of the storm-tormented night, but he was determined to make full use of every minute of them. There was a lot to be done to the little vessel that had fallen into his hands. Another leader would have dispatched exploring parties to investigate the possibilities of the island—but this the sailor refused to consider until he had the means of making a quick getaway under his feet. He knew that there was a town or city of the natives to the nor-ard—it could be seen, on occasions when the misty drizzle thinned, from the hill above his beach. And he knew that the inhabitants of this settlement must inevitably prove hostile. When they sent a second raiding party to inquire after the fate of the first they would meet with a warm reception. Until then—let sleeping dogs lie. Meanwhile—work, sleep, work and yet more work.

After the killing of the last survivors of the crew Whitley decided to careen the vessel. The current was settling down on a long split of sand running halfway out from the beach to the reef. All he had to do was veer his cable—the windlass was primitive but quite workable—until the ship grounded on the smooth, gently shelving bottom. Then it was a case of running mast-

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head tackles out to convenient trees along the cliff top and heeling her to expose her bottom.

As he had suspected, she had no keel. This would mean—as her rig implied—that she was quite capable of making considerable speed running free, but with the wind anywhere near the beam would go crabwise. But with the bottom in its present disgusting state he doubted whether she could make a bare two knots in full gale. So everybody had to turn to with improvised scrapers to clean off the tendrils of weed and numerous mollusks which, in conjunction, conveyed the impression of a sort of marine rock garden. Having no anti-fouling composition he doubted whether this state of unnatural cleanliness would last for long—but he would careen at every available opportunity if need be.

The inside of the ship was far from suitable by Earthly standards. The slimy, green algae were everywhere. But some flat stones were found and used in conjunction with the fine, black sand—and so the holystone made its bow on Venus.

The vessel was about seventy-five feet in length with a beam of fifteen feet. There was a single mast, on which was hoisted one big, square sail. It was a primitive rig, one that argued a race little advanced in the long climb upwards from savagery. And yet there was so much about the ship that was not primitive; for example a magnetic compass almost the equal of anything he had seen in his own place and time. And the weapons—even the knives—showed a high standard of workmanship. The little crossbows were of metal—as was the larger version which fired the big, ten-foot shafts. They were the sort of things that a civilized man would make were he obliged by some circumstance to abandon his modern small arms and artillery. As for the crude, unseamanlike rig—it argued a people long used to mechanical propulsion having to relearn the lost arts of their forefathers the hard way.

The rig could be bettered. There was the parachute to draw upon for sailcloth, what remained of the breeches buoy for standing and running rigging. There was a set of what could only be sailmaker's tools among the miscellaneous gear, some of it defying identification, left by the Venusians. It would be easy enough to contrive a decent suit of sails.

After much cogitation Whitley decided on a standing lug and a jib. He was no sailor, just a seaman, and thought it advisable to stick to a rig with which—it was the orthodox lifeboat rig of his own time—he was familiar. The original yard would have to serve as a gaff; the blocks, which were not in bad condition, he would leave standing, merely substituting his own wire for the dubious looking cordage he had acquired with the ship.

Then there was another idea he had in mind—one that would entail putting the sweeps—she could put out six to a side—to a use of which their late owners would never have dreamed. By the time he finished

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he would be able to outsail anything on the Venusian sea.

To him, whilst he was tracing diagrams in the sand with a piece of stick, came Leonora Starr. She stood for a while watching him, her expression of irritation deepening. She frowned. Truly, he had suffered a sea change. At first she had been drawn to him, he had been so lost, so bewildered, a fish out of water. Now he was a fish in its native element. A motherly compassion on her part had been replaced by feelings she did not care to analyze. But she could not deny that the fact that he seemed to have no time to spare for her hurt. She knew that the ungainly contraption out there on the sand spit was more of a rival for his affections—forgetting the long ago and far away Jane—than any woman could have been.

She coughed.

He gave her a cursory glance, said "Yes, Leo?" and went on with his drawing.

"Things are pretty well squared up inside," she replied. "We found some more of those awful, slimy things with legs—whether they were pets or pests I can't say."

"We'll leave that to the scientists. I'm afraid that the glorified crossbow affair on the foredeck is going to ruin the cut of my jib. Don't feel like dismounting it, though; it might come in useful."

"Can't you think of anything else but your beastly ship?" she flared.

He looked up with an expression of mild surprise. "Why, no," he said.

"I'm sick and tired of it. So is everybody else. People want to investigate this island, this world, to see what the Venusian town is like, to get some idea of the flora and fauna. But here we are, stuck on this ruddy beach, sweating and slaving away at *your* toys. And if she was good enough for the people who built her—and they should have known what they were doing—she's good enough for you!"

"She's not. When that ship is something like a ship we'll have time to nose around. But we don't know when the night is due—it's roughly thirty-six hours since dawn now—and we must get her finished."

"And then?"

"And then we get out of here. We aren't far from the equator—I unshipped a magnet from their spare compass card and use it as a dipping needle—and I think we shall find a healthier climate in the polar regions."

"That's what *you* think!" she said with what he considered unjustifiable bitterness. "That's what *you* think!"

She turned sharply on her heel and strode away. For a few moments Whitley looked after her retreating figure, the beginning of a frown starting to furrow his brow. A few seconds later he was busy once more with his diagrams, all else forgotten but the problem of how to modify his sail plan to accommodate his armament.

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Leonora was in a vile temper as she paced along the beach. Halfway to the cave she was accosted by Miss Emerson.

"Oh, Leo," said the catering officer, "don't you think it's time that we thought about living off the country? My stores won't last forever, you know."

"Don't bother me, see Dale. He's the Big White Chief around here!"

"But I thought—"

"Don't. There's only one person allowed to do any thinking in this world!"

In the cave she tried to find something to occupy her mind. But the affairs of the hospital instituted by the surgeon and herself were running quite smoothly, the assistant nurses she had recruited from among the passengers had things well in hand. But she left one of them in tears and the other on the verge of attempted murder. The few adult patients watched the scene with considerable amusement, the half dozen or so children found it all just one more bewilderment in what they had come calmly to accept as an incurably bewildering scheme of things.

When she came out into the open the misty rain had cleared. To the eastward, perhaps ten miles distant, lay a long, black archipelago. It had been seen before, but never so distinctly. She went back into the cave, found a pair of prismatic glasses and studied the chain of islands. It occurred to her that she might be able to see more—and perhaps something of interest—from the hill above the cliff top.

Whitley had made it a rule that nobody was to stir from the environs of the camp alone. In her present mood she felt that Whitley's rules were made to be broken. Another rule was that any party away from the main body was to be armed. She hunted around for a spare automatic rifle, but they had been restowed and were not in their usual place. And she would ask nothing of anybody—even a simple request for information would have been beyond her. Besides, the hill was of almost bare volcanic rock and she was confident that she would be able to see anything or or anybody coming from the jungle below in ample time to make good her escape.

It was only a short climb from the cave to the top of the cliff. The hill, all of five hundred feet above sea level it must have been, took longer. Done in sweltering, humid heat the ascent was a major operation.

When she was on the summit she looked, first of all, all around her. Down on the sand spit she could see the ship with the figures of men and women swarming about her, ludicrously like ants about some huge insect that had blundered into their nest to its own undoing. To the north she could see the native town, just beyond the swamp, with the shapes of other vessels in its harbor. She wondered why the omniscent Mr. Whitley did not station a permanent look-out on the hill to spy out the enemy's shipping movements. She forgot that visibility was usually so poor that any-

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body there would have been wasting his time, besides standing a good chance of being attacked and killed by Venusians creeping up unseen.

Southward, the volcano seemed more than usually active. She felt a thrill of premonitory dread as she watched its ever expanding plume of smoke. With her glasses she could distinctly see occasional spurts of lava spouting up over the crater rim. Once there was some kind of internal explosion which sent a shower of rocks high into the air.

But she had come up here to look at the distant islands. From one end of the archipelago to the other she swung her glasses, and then back again. She thought she saw smoke, although it may only have been a distant rain squall over the land. Her attention was distracted by a sudden movement in the sea about two miles out. Three huge shapes broke surface, the speed with which they had been traveling submerged sending them high out of the water. They spread huge, graceful wings, soared, and with lazy ease made off to the northeastward. She had seen the flying fish of Earth; these, too, were flying fish—but flying fish that could really fly.

Following their flight with the glasses she found herself looking at a flotilla of black shapes drifting down between the islands. She thought at first that this was a fleet of Venusian sailing ships, made to run down the hill to warn the camp of the impending invasion. But she restrained herself. They were miles off as yet and she would have ample time to estimate numbers and armament before there was any real danger. Furthermore, it was essential that she stay at her post until the last possible moment, for it had been found that fog or the thick, misty drizzle was liable to come down without a second's warning.

So she kept her glasses glued to the advancing armada whilst, with a fair northerly wind and the south setting current down the straits to aid them, they advanced with surprising rapidity. At the finish she began to have her doubts. There was a certain softness and irregularity of outline in both hull and sails. And when she saw the leading ship lift, on the end of a long tentacle, a struggling, fishlike form from the water and lower it into what could only have been its maw her doubts were confirmed. Still—it was interesting. She wondered whether the strange beasts were entirely at the mercy of wind and tide, or whether they could sail —what was it that Dale called it?— close hauled. Blast Mr. Whitley-Dale, anyhow. Him *and* his ships.

The scene before her was suddenly blotted out. Automatically she made to wipe the prismatics on the hem of her skirt, then realized that, without warning, the fog had shut down. She could no longer hear the cheerful sounds of voices and hammering from the beach. It was, suddenly, very lonely on the hilltop. In spite of the heat she shivered.

But she was confident that she would be able to find her way down.

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She had been up here before, with Whitley. Now if *he* were here he'd try to steer a compass course or face the wind and tell you that the barometer was lower on your left hand than your right or something equally absurd. But he would be company. He would be able to laugh at you in a reassuring sort of way when you thought you heard slimy, slithery sounds on the rocks on both sides of you. And he would have come with a heavier armament than the pair of none too sharp surgical scissors that you happened to have in your pocket. And he would have known what to do when the slithery sounds closed in from all sides and the fog stank with the revolting, fish-carrion smell of the Venusians. He would—

Leonora tried to scream, but a slimy, webbed hand was pressed over her mouth. She tried to use her pitiful scissors, but her arm was brutally twisted and the little implement tinkled unheeded to the ground. She waited for the keen edge of a blade at her throat, but it did not come. Instead, half dragged, half carried, she was borne off silently into the fog.

"Where's Leo?" Whitley had roughed out his sail plan to his own satisfaction and now wanted somebody to talk to. "Where's Leo, Doc.?"

"Don't know, Dale. She was in here a while ago, they tell me, raising Cain and making herself generally unpopular—but that must have been before the fog came down. Thought she was with you."

"No." Then—"I'll see if the sentries have seen her."

"Hm-m-m. Quite worried,'" said the surgeon, to nobody in particular, smiling to himself. "But Leo's too smart to get into trouble. And when he does find her they'll just have another row.

Meanwhile, Whitley was interrogating his sentries. Those to the north and the south of the beach were positive that she had not passed. So was the man who had been stationed at the head of the path from the cave to the top of the cliff. But somehow, his protestations failed to carry conviction.

"So you never left your post. You're lying. Never mind how I know. I'll deal with you later. Come on!"

Followed by Taberner and Stanley he started up the path to the hill. The mist had cleared considerably and the visibility was fair. He did not see what he dreaded to see—the body of Leonora transfixed by a crossbow shaft or hacked by a broad-bladed knife. It was only by chance that he saw the little pair of scissors, their brightness already dulled by the saturated air.

"There's been a struggle here," said Taberner. "These must have been the only weapon she had. Look! You can still see where the slime has been scraped off their feet by the rock." He was nosing around like an excited little terrier. He pounced on something that had escaped the notice of the others. Mutely, he gave it to Whitley for his inspection. It was a shred of cloth, once white but now stained

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dirty green by the slime from the Venusians' hands.

"We'll take the ship," said Whitley. "We'll sail her round and attack in force. And if . . . if—"

"No, skipper," said Taberner. "Too obvious. It's clear now, and they'd see us coming, be ready for us. But three men with rifles coming overland might, with luck, do something. A bigger party would be spotted."

Members of Leonora Starr's profession are not prone to panic. She was no exception to the rule—but on this occasion she found it hard not to lapse into a futile, energy-wasting struggle. Struggle she did, but with what she hoped was a certain calmness and deliberation. She went on struggling long after it became obvious that she would be better advised to save her strength. But she was no match for the four Venusians of the scouting party. Two held her arms, one kept his stinking, webbed hand tight pressed over her mouth, the fourth led the way down the hillside.

What made it hard for the girl was the knowledge that she was in a hopeless predicament unless help came from the camp. Had her captors been human—even the veriest dregs of humanity—she would have been confident of her ability to win clear by the use of weapons far more deadly than the little futile pair of scissors that had dropped unheeded to the ground, than the broad, sharp knives of the Venusians. But on these aliens the old, black magic would never work,

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even had she possessed command of their uncouth language.

Aliens? No—not quite. That was the worst part of it. She realized that she must have been taken prisoner for one purpose only—as a specimen. Woman dissects frog, she thought. That's not news. But— The thought made her, almost involuntarily, start struggling again. The leading Venusian, who seemed to be in charge of the party, turned and gave her a stunning buffet on the side of the head.

The texture of the ground underfoot was changing. The rocks gave way to a more even and softer footing. She could not look down—the native whose hand was over her mouth had forced her head back so that she could see only the murky, yellow sky—but she could feel it through the soles of her thin shoes. Like moss, it felt.

As they progressed it became more marshy. The mud crept up over the tops of her shoes, slid down between foot and lining. She could hear the loud squelch as her captors set their broad, webbed feet down, the sucking noise as they lifted them. And the warm slime mounted to above her angles, her knees. Inch by inch it climbed her thighs. The stink of corruption, of fecund life decaying even as it flourished, became overpowering. She tried to look down. Surprisingly, the Venusian with his hand over her mouth offered no resistance. She saw that she was being led across a swamp, a quaking quagmire of black, stinking mud.

Perhaps it was that the natives knew a secret path across its seemingly trackless filth, perhaps it was that their webbed feet gave them the support that a man would have lacked. But Leonora saw that she could not expect a rescue party to come *this* way—if there ever were a rescue party. She did not consider the possibility of a rescue by sea. Whitley's sailing ship was never more to her than a rather incomprehensible masculine toy.

With slow, uncanny rhythm the surface of the swamp heaved and pulsated. Now and again great bubbles would rise from its depths, break surface and burst. Once one of these floated up under the feet of the party, oversetting captors and captive into the stinking mire. And when the bubble burst the stench of the swamp was multiplied a thousandfold so that Leonora choked and retched. So concerned was she with her physical discomfort that she did not try to break free from the Venusians—had she succeeded in so doing it is almost certain that she would have sunk without trace into the noisome depths. In any case, slithering and floundering as they were, their grip on her arms never relaxed.

As the journey continued Leonora saw long, dripping tentacles rise questingly from the slime. Once one came close, undulating over the quaking surface like a snake. One of the Venusians slashed at it with his machete, slicing off its tip. It withdrew hurriedly. And then she saw another lift something small, black and amorphous from the mud.

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It struggled and squealed, and then was drawn from sight. Only a few, slow bubbles marked the place where it had vanished.

At last the gait of the Venusians became less of a swim, more of a walk. She felt her feet finding something like solidity. And then there was firm ground under them once more. She looked ahead to see a stockade in which yawned an open gate.

Her captors hustled her through the town or village far too fast for her to form any estimation of its size. Too fast, even, to acquire an idea of its nature. She had fleeting glimpses of huts apparently made of reeds and mud, of staring grotesques in every doorway. She heard the coarse croaking that preceded her and which died gradually away after her passage.

And then she was being taken along what must have been the waterfront. There was a quay of slimy stone, and alongside, moored in tiers, lay the ships. To Whitley the stark beauty of mast and standing rigging would have meant something. He would have been able to make a rough estimate of tonnage, of carrying capacity. But all this was wasted on the girl. What she *did* see—and who could have missed it?—was an unmistakable rocket-ship made fast alongside a wharf of her own. Of her earthly origin there was no doubt. In spite of the green algae thickly coating her hull she could see, blurred and distorted by the coating of slime, an unmistakable Hammer and Sickle. And the Russians had, she knew, been among those who had sent a recent expedition to Venus.

She tried to dig her heels in, to hang back and look at the ship of space, incongruous among the slovenly little surface craft. But the talons of her captors dug viciously into her arms and she was dragged, half sliding, along the quay.

One thing more did she see before she was hustled down a flight of slippery stone stairs. This was a basin, its seaward end fenced in. The fencing, as far as she could see, was of two different periods. There was an elaborate, fanciful tracery of wrought metal patched, in the frequent gaps, with a crude interlacing of rough laths. In this basin swam myriad creatures. Some were merely a head and tail, some showed the beginnings of fore and hind legs. A few, their tails almost withered away, squatted at the water's edge, stared at her with great, mournful eyes. With a note of unmistakable interrogation they croaked at her escorts. Brusquely, her escorts replied. And then she was stumbling down the worn steps into the noisome darkness.

And then there was light of a sort. From concealed sources it came, a green, flickering glow. By its dim, fitful illumination her captors seemed more froglike than ever. Their appearance, combined with the watery quality of the lighting, made it seem that they were clambering down, down and down, fathoms beneath the sea surface. Womanlike, she found time to wish that this were so. She longed for

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clean water to wash from her face and body, clothing and hair, the muck of the swamp. As an ambassadress of humankind, albeit an unwilling one, she was acutely conscious of the fact that her appearance left much to be desired.

At length they came into a large chamber. Along one side was a huge, rectangular window. Through this came the dim, diffused light of the fathoms deep sea. Uncouth things swam within her range of vision, now and again pressing hideous heads against the glass. Those within the room ignored them.

The floor was running with little rivulets of moisture, whilst others trickled down the sweating stone walls. Over all were the ubiquitous green, slimy algae, hanging in festoons, even, from the low ceiling. There was a rank odor of moist decay.

Here and there, against the walls, were machines at whose purpose she could not guess. They appeared to be the essence of simplicity, just huge drums on their sides with one parchment covered face open to the inside of the room. By each one stood two batrachians, one holding a kind of stick and the other what appeared to be a pad and stylus. She became aware of a tapping in broken rhythm coming from one of the drums. Then its staccato song ceased with a flourish. He with the stick rattled out what must have been a reply or acknowledgment on the parchment diaphragm before him whilst the Venusian with the stylus scribbled rapidly and industriously. He brought his pad to the low, stone table from which, until now, Leonora's attention had been distracted. The frog man seated at its head snatched the pad from the webbed hand of the messenger, held it briefly before his eyes. He croaked rapidly to his fellows along both sides of the table, and some of them made guttural reply. He then barked what was obviously an order at the messenger, who made a sort of obeisance and withdrew. The Venusian with the stick beat a rapid tattoo on his instrument, and then, for a little, there was silence.

Leonora studied the group at the table. Although they were no different superficially from the other Venusians with whom she had come into contact these, undoubtedly, were among the rulers of this watery world. Authority sat on them like an almost visible garment. It was, in fact, their only raiment, although all of them wore, probably as symbols of rank, ornaments of bright gems and intricately worked gold. It was these jewels more than their incomprehensible machines that forced upon the girl the realization that these were no mere savages but newly arisen from the swamps, that she was face to face with the representatives of an ancient culture. And once again she became acutely conscious of her filthy and bedraggled appearance.

She need not have worried. At a command from the Venusian at the head of the table her escort gripped her arms even more brutally, hustled her a few paces forward so that

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the rulers might look upon her. Against her will she was forced down into an humiliating mockery of a curtsy. For scant seconds she was studied with a lack of interest that was insulting—although when she saw the four human skulls—one of them undoubtedly female—on the table she understood why her capture had not aroused any wild enthusiasm.

Then she was jerked around and hustled and prodded into the ascent of the slippery stone stairs.

To the north of the camp the beach diminished to the merest strip, and then ceased to exist where the cliffs marched down steep and sheer to the water, Whitley was forced to admit that his first plan for a march along the sand could be washed out. Approach by sea was more practicable—but this would be the quarter from which the Venusians would surely expect counterattack. This left only the swamp.

And yet the disadvantages of this were so obvious that he was inclined to take the ship and all the rifles he could muster and attack in force. It was only the realization that, by so doing, he would run the risk of robbing the party of its only means of transport, of escape, that made him cudgel his brains for an alternative plan. And every avenue he explored led him inexorably back to the one place he most wished to avoid—the swamp.

But there were planks in the ship. What their original use had been he could not say—possibly spares for repairs on the spot in the event of the hull being stove in on some uncharted rock. Be this as it may —they would afford transportation across the morass.

Whitley gave his last orders to Pawson and Jenkins and then accompanied by Taberner and Stanley, set out. Each man had a rifle with ample ammunition, and each carried a Venusian knife. The hunter and the cadet had one plank each, Whitley carried two. He had to tell himself at frequent intervals that this fourth board would be necessary.

Taberner followed the trail of the raiding party with ease down to the swamp verge. Here it ceased. It could not be expected that the slimy mud would carry any permanent imprint.

They looked across the heaving expanse to where, on the further side, a row of tall growths, not unlike the tree ferns of an Earthy antipodean rain forest, marked more or less solid ground. It looked a long way. It was a long way. But it was a way that must be traveled.

Whitley went first. He waded in until he felt himself sinking, then threw himself flat onto his two boards, which he had lashed together. They supported his weight. Experimentally, fearful of losing his precarious balance, he kicked his feet. With painful slowness the planks moved forward. Having his face brought thus into close proximity to the stinking mud was unpleasant, but unavoidable. At first he wanted to vomit, but in a

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short time he was so engrossed in the problems of propulsion that the smell almost ceased to register.

The passage of the swamp was not without incident. There were the questing tentacles rising from the fetid depths, although only once did they constitute a serious menace. One snaked along the surface unobserved and caught Stanley by the ankle. More by luck than judgment Taberner was able to bring his blade into action in time. And there was something which could have been a crocodile, except that it had broad fins which were almost wings on which it slithered over the surface. It followed them all the way to the further shore, but made no attempt to attack.

There was, after all, a sentry among the tree-ferns. Like Whitley, before he had worked out his plan of action, he had decided that the swamp was impassable. When they found him he was seated at ease under a low bush bearing huge, fleshy blossoms, from which came a scent of putrescent sweetness. Around these hovered a cloud of little flying things, scarcely larger than a terrestrial house fly. All the Venusian's attention was centered on them. At intervals his mouth would open and a long, whiplike tongue would flicker out and back with lightning rapidity. Each time the number of insects would be diminished by one—but the supply was seemingly inexhaustible. It lasted out for *his* time, anyhow. The humans left him with a cleft skull into which, already, were creeping long, pallid worms that had appeared as though by magic from the sodden earth.

The gate in the stockade through which Leonora had passed was still open. The guard here was more alert than the first one had been. And to have attacked from a distance, with firearms, would have been to raise a general alarm.

"Leave this to me, skipper," said Taberner.

Beneath the trees there was a thick layer of vegetable detritus. In this the hunter rolled, the pallid green leaves and rubbish adhered to the mud with which he was literally coated. The little hunter had taken the crossbow from the first guard, this he loaded and cocked, careful to do so as silently as possible. Taking advantage of every scrap of cover he crept closer and ever closer to the Venusian, until he was within such range that he could hardly miss if he tried, even with this unfamiliar weapon. There was a faint, musical twang, and the guard crumpled.

"Something else," said Taberner. "I should have thought of this before." From inside his soaking clothing he produced a square of cloth that, somehow, he had contrived to keep clean. The three men wiped the mud from their rifles, improvised pull-throughs with long stalks of a reedy growth.

Then, cautiously at first but with increasing boldness, they passed through the stockade and entered the village. Taberner lagged a little. When he rejoined the others he said, "They won't be shutting that gate in a hurry!"

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Had it not been for the sentry at the gate and the lived-in appearance of the crude, filthy houses they would have thought they had entered a ghost town. But as they penetrated deeper, threading their way through all kinds of rubbish and filth, they heard the sound of batrachian voices. Like a chorus of bull frogs it was—a sound somehow very homely in these outlandish surroundings.

Oppressed by a dread to which he did not dare put a name Whitley pushed on, his rifle at the ready. Caution was forgotten, for he knew that he would find Leonora at the place from which came the rhythmic yet unmelodious song of the frog people, augmented now by the throb and rattle of little drums.

In the center of the Venusian town was a clearing. The word *square* or *plaza* would convey an entirely wrong impression—for trees and assorted vegetation were inextricably entangled with dwelling places throughout. In many of the houses the framework of the mud and thatch structure had burst anew into life, so that it was indeed hard to tell which were natural growths and which artificial structures.

But the humans were not interested in the vagaries of the indigenous architecture. What held all their attention was a wicker cage standing on a low mound in the middle of the clearing. In this was Leonora. Had they not expected to find her there they would never have recognized her—so blurred were her face and figure by the thick coating of filth. Around the cage milled an excited mob of Venusians. They were prodding her with sticks, scooping up handfuls of the mud from underfoot and pelting her with balls of slime. When it was all over Whitley thought of the barbarities practiced by Earthly children on hapless toads and frogs. But now his only concern was to get his rifle into action—and fast.

It was not much of a fight. The Venusians were taken unawares and fell like blades of grass before a scythe. Through the mass of the dead, careless of the blades that flickered up at him from those yet a-dying, trampled Whitley. His own blade was ready, and with it he hacked at the bars of the cage. He was dimly conscious of sporadic bursts of fire as Taberner and Stanley picked off such small pockets of resistance as remained.

Then the girl was in his arms. "What have they done to you?" he was saying over and over again. "Are you all right?"

At last she broke away from his embrace. "I'm quite fit," she said. "But hadn't we better be getting away from here?"

He became aware of Taberner's voice. "Time we left, skipper. They've called up the regulars!" As though to emphasize the little hunter's words a crossbow bolt whizzed by, scant inches from his head. Somebody loosed off a burst of fire from his automatic rifle. "Blast this place!" he heard Stanley mutter. "Far too much cover."

So began the retreat to the swamp. Rifle answered crossbow,

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vaned bolts and the little vaned rockets skimmed past each other on their opposed trajectories. On neither side was the shooting effective. As Stanley had said—there was too much cover. And once the humans were away from the clearing this was, under Taberner's expert guidance, a factor which helped them as much as it did their enemies.

A party, sent a roundabout away, did succeed in reaching the stockade before the fugitives. But the hinges of the gate, made of hide, they were, had been cut by Taberner. And while the Venusians were still struggling to push it into place they were cut down by the automatic rifles.

The four planks were where they had left them. Hard by lay what was left of the body of the first sentry—now only bones remained. Whitley spared it barely a glance. He gave Leonora hasty instructions in the technique of traversing the swamp, then— "Where's Taberner?" he demanded.

Even as he spoke the little hunter came on the scene and took hold of his plank. "Just been making that gateway of theirs a very unhealthy place," he explained. "It'll be a long while before any of 'em dares poke his nose outside the stockade. What a ruddy pity their hides have no market value."

"Good man!" said Whitley. "You — What's that?"

That was an earth tremor that all but threw them off their feet. It was repeated, with even greater violence. From the walled township behind them rose a crescendo of guttural cries, through and above which, staccato, insistent, throbbed and rattled the little drums.

Whitley looked to the southward. The volcano, that by night had served as a beacon light, that by day had been a brooding, omnipresent pillar of smoke, had awakened to ominous activity. Great spurts of molten matter fountained from its crater, and, in spite of the freshening northerly breeze, a portentous rumble was increasingly audible.

"Time we got back," he said.

The boards were launched, one by one, on to the surface of the swamp. It may have been imagination, but the warm slime seemed much hotter than before, the slowly rising bubbles from the fetid depths more frequent. And mixed with the rank odor of decay was the unmistakable tang of burning sulphur.

In spite of the portents of the burning mountain, the shivering earth, the Venusians did not easily give up the chase. Of this the fugitives became aware when they were, perhaps, about a third of the way across the bog. The first evidence of pursuit was a shower of bolts that, luckily, all went wide. It is hard to take accurate aim whilst treading water—or mud.

Nevertheless, succeeding volleys showed a marked increase of accuracy. And they were no longer coming from right behind the fugitives, but from both sides. It was obvious that the pursuit was gaining fast. Had they possessed the confidence to close in and fight it out

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hand to hand they would have made a finish of it—but it seemed that they had a healthy respect for the Terrestrial firearms.

When a bolt stuck, quivering, in his plank less than an inch before his nose Taberner cursed. "This is no good," he said.

"No," agreed Whitley. "We'll have to stop and fight it out. Stanley, you carry on ahead with Miss Starr."

The cadet protested. "But, sir, if anybody's to make sure of getting out it should be you. They're all depending on you back at the camp. They—"

"Never mind that. I'm tired of being treated as a sacred cow. Get to the other side with Miss Starr, then you can loose off a few rounds if you like. And if Taberner and I are scuppered—don't stop. Get that?"

The sailor and the hunter stopped their paddling, disposed their bodies comfortably athwart their boards. Taberner fished out his invaluable rag and the rifles were given a hasty, superficial wipe. But they fired without jamming.

The Venusians had them almost surrounded. The main body of the enemy was still coming up behind, but on each side faster, or bolder, parties were attacking from the flank. But now they were at a disadvantage. Thanks to the boards on which they were resting the humans could shoot fast and straight. On the flanks the batrachians croaked and grunted, sank one by one into the black, hungry mud. The rearguard halted, seemed to pile up on itself.

"'*While those behind cried* Forward!
And those in front cried Back!'"

quoted Whitley.

"What was that, skipper?"

"Never mind, Horatius. Just keep on pumping lead into the baskets!"

A third rifle, close, added its song to that of the others. Whitley half turned. "Stanley! I thought I told—"

"So you did, sir. But—"

"It's not his fault," said the black apparition beside the cadet. "I—"

"You would. But come on. We've got a breathing space!"

The quartet flung themselves flat on their boards again, and, with feet going like outboard motors, resumed the slow creep over the mud. Fresh showers of bolts came from behind, but not with sufficient frequency and accuracy to cause any great alarm. The edge of the swamp, with its tall, rank growths, loomed ever closer and more desirable. It seemed that solid ground was almost within grasping distance when the black slime ahead of them erupted fantastically. Scaly, webbed hands rose from the ooze and clutched at their clothing, at the edges of the boards. Knives were out on both sides, once bright metal gleaming dully through the coating of filth. Taberner stared stupidly at a right arm that ended abruptly in a red-spouting wrist. By some miracle of contortion he got his left

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hand round to the rifle slung on his back, grasped the barrel and brought the butt crashing down across the bulging eyes staring at him from the mud. Whitley and Stanley were cutting and thrusting desperately, trying to keep the girl between them. This was almost impossible when attack came from all sides and beneath. Leonora snatched the sailor's rifle from its sling, followed the example of the dying hunter.

And now the liquid mud was alive with more than the frog people. It may have been the odor or the taste of freshly shed blood, it may have been the frantic struggling and threshing. But, first singly and then in dozens, appeared the long, thin tentacles. Blindly, inexorably, they snaked among the combatants, and once their coils had hold only a ready knife spelled salvation. And for each one lopped short twenty uninjured ones made their appearance.

"Where's Taberner?" gasped Whitley, in a short lull.

"Where's Taberner?" repeated the others.

And then the deadly battle in the swamp flared up again, a fight to which, now, there could be only one possible conclusion.

So it was that when, miraculously, all opposition ceased they went on mechanically stabbing and hacking. But it was hideous, bloated corpses on which their blows fell, tentacles that sprawled limply, squirming spasmodically and feebly, over the bubbling surface. The *bubbling* surface. It was not boiling—yet, but the bed of the morass must have been already heated to the point of vaporization. The humans realized, suddenly, that it was hot. Not so hot that they—warm-blooded animals—could not endure a few moments more of it. But hot enough to have caused the deaths of their cold-blooded enemies. And hot enough to make it imperative to get out—quick.

Progress was less easy now than it had ever been. The belt of dead and dying batrachians was relatively narrow—but all kinds of obscene shapes had drifted up from the depths, sprawled in hampering tangles of limbs and tentacles in their path. And there was a thickening fog over the surface of the mud, a fog that, when breathed, caused exquisite agony in the lungs, that, for long seconds, left them hanging coughing, choking and helpless on their frail boards.

Leonora, who was leading, realized, almost without comprehension, that she was trying to propel herself through a tangle of coarse reeds and grasses. She got off her plank, stood shakily erect. The heaving ground threw her flat on her face. She picked herself up again. Through the mist she saw Whitley and Stanley, stationary in the slime, their legs still kicking mechanically, their hands making futile paddling motions. She waded out in the ankle deep, almost boiling ooze. One after the other she grasped their collars, pulled them to their feet. "We're here!" she had to say over and over again. "We've made it!"

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None of the three was in any condition for a quick march back to the camp. But they forced their tired limbs and bodies into some semblance of speed whilst every muscle, every nerve, was shrieking for rest. Breathing had ceased to be a purely automatic function, every inhalation called for will power, for the determination to ignore the pain as the sulphurous air irritated the already smarting lung surfaces.

But it was plain that the island was in the throes of disintegration. To the south they could see, down wind, the column of flame-shot smoke overhanging the volcano. Frequent, heavy detonations shook the air and shook the ground. Almost unnoticed little, terrified things brushed past them at times almost oversetting them, flying madly for the north and nonexistent safety.

They came to the path leading to the cliff edge. But there was now no sharply defined brink—only a slide of rocks and rubble sloping down to the beach. The cave mouth must be buried. Sharp anxiety assailed them, quickened a pace that had already reached the seeming limits of endurance. They were sobbing as they slipped and scrambled down over the sharp stones, cutting and bruising feet and ankles.

At the bottom of the slide Whitley slipped and fell. He lay face down on the shuddering, quaking sand, lacking both the strength and the will power to get to his feet again.

He felt hands under his arms, protested feebly as he was jerked erect.

"Dale!" somebody was saying urgently, "Dale! We've got to get out of here. We've got to get out!"

He ungummed his eyelids, looked into the anxious face of Pawson. He forced himself to speak.

"Ev. . . . everybody . . . in . . . the . . . ship?"

"Yes. Everybody and everything. Come on! Where's Taberner?"

"Dead," he heard himself say in a dull flat voice.

Others came from the ship to help Pawson. He was carried to the side of the little vessel. It was obvious that he could not negotiate the short Jacob's ladder, so somebody lowered a line. He had enough energy to insist on bending its end first around Leonora, then Stanley and then—for he had insisted on seeing the others aboard first—himself. The feel of a deck under his feet made him feel a little better, but he yet had to be convinced that anything mattered.

Somebody thrust a glass into his hand and said: "Drink this!" Automatically his hand went up to his mouth and he gulped down the acrid fluid. He coughed and spluttered—but he could feel his brain clearing almost as though he were watching a fog drifting from the outlines of a familiar landscape. His eyes opened. He saw the surgeon, holding in his hand a bottle.

"Any more?" asked that officer. Then— "You'll pay for this later,

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but it'll keep you going for a few hours."

"Thanks, Doc."

He was alert almost at once, looking around and taking everything in without effort.

"Get all these people below decks," he said. "And all this gear. No room to do a thing. Six of you get on to the windlass. That's right, start walking round it. No, not *that* way, you fools!"

As the cable tightened and the ship slid off the bank he found time to joke.

"This is her launching, really," he said. He patted the tiller affectionately. "I hereby christen you *Jane Elizabeth!*"

Those who heard the words wondered why he had not made the obvious choice in the matter of names, only Leonora knew the significance of those that he had chosen. And she felt a stab of jealousy. Even here and now she envied the woman who could still call to him across interplanetary distances and centuries of time.

But Whitley had no eyes for Leonora Starr. He was looking to the north and the south, weighing the chances of escape by either route. To the nor'ard the way between shore and shoal was clear. With power under his feet he would have taken this course without hesitation—but realized that he could not hope to buck both wind and current. Even had he decided to try there would have been barely room to tack, to beat to windward, in the narrow strait.

But to the south the way was not clear. From the burning mountain ran a torrent of smoking lava, pouring in a boiling cataract into the sea. It seemed, at this distance, that the entire strait must be choked with the molten rock.

Again Whitley looked to the north. He could, if there were no other way, put out his sweeps and pull *Jane Elizabeth* up the straits by sheer muscle power. And he couldn't see himself doing it with such an unskilled crew. And as he watched, this way was blocked. There was a deafening explosion and a great fountain of rock and boiling mud shot to the low sky. When the steam cleared he could see that the channel was now a seething caldron.

Luckily, the seismic disturbances were widespread. From seaward came rolling in a slow, heavy swell. Every now and again a huge sea, greater than its fellows, would roll over the reef with a smoothness that showed that the rocks must be submerged feet deep. While *Jane Elizabeth* stirred uneasily, tugged impatiently at her cable, Whitley watched this phenomenon. He frowned. Then— "It's the only way," he said, half to himself. "But first, steerage way—"

He barked orders. The crew, who had been drilled by him in what had seemed to them to be senseless routine, walked around the crude capstan. They tailed on to the mains'l halyards. Whitley caught

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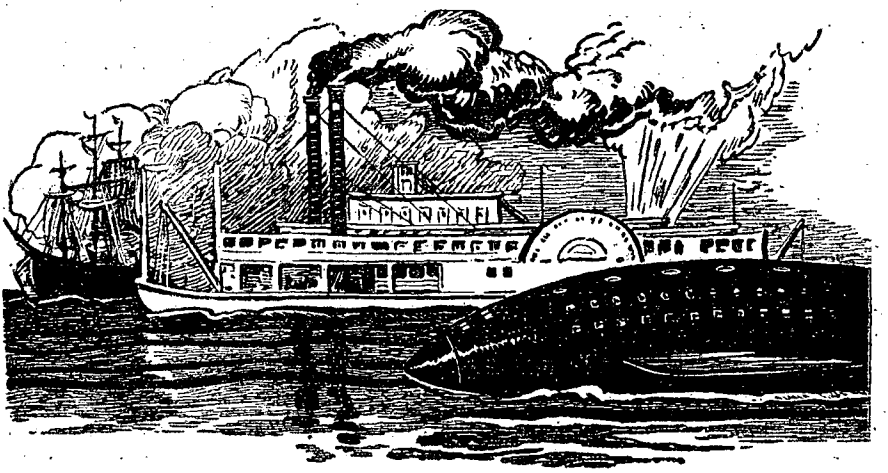
himself singing the words of an old halyard chantey—how he had sneered at those who still sang them in the age of steam and steel!—as the big quadrangle of dirty parachute silk climbed jerkily up the mast. *"Way . . . hey . . . and* up *she rises. . . . Way . . . hey . . . and* up *she rises. . . ."* The grunts of the pullers, the rhythmic creaking of the blocks, kept time with his song. *"Ear-ly in the morn-ing!* Make fast your halyards, there! Now the tack—that's not tight enough! Bring the sheet aft!"

Something knocking metallically against the bows told him that the anchor was aweigh. Good. Experimentally he moved his tiller. At first *Jane Elizabeth* did not answer, although, under the influence of current only, she was drifting slowly down the strait. Then the sail filled with a thud that almost unstepped the mast and the little ship charged for the reef. Whitley desperately put his tiller hard-a-port and he saw *Jane's* nose swing to starboard. As she jibed the boom swept across the deck, almost carrying away the sheet as it was brought up at the end of its run.

That wasn't good enough. Whitley had hoped to be able to put his ship through her paces before he took her anywhere, had counted on being able to get the feel of her. But he was having to make up the rules as he went along.

More by luck than judgment he got her under control. The sheet was adjusted to his satisfaction and she was steering not too badly. He thought of hoisting his jib, but decided that that could wait. He looked ahead to the boiling sea, the glowing torrent of lava, that was growing ever closer. He looked to seaward, and realized with a heart-stopping shock that the heavy, seismic swell had died down as suddenly as it had arisen. "Stand by the halyards!" he shouted. "Stand by to let go the anchor!"



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The order that would bring the sail down with a run, that would send his grapnel to the sea bottom, trembled on his lips. The unholy union of fire and water was dreadfully close. Down wind as it was he could already feel its heat, already smell the acrid fumes. "Let —" he began.

"Wait!" Viciously, Leonora gripped his arm. She pointed to seaward. Humped well over the misty horizon appeared a hill of water. Swiftly, it sped shorewards. Taking his eyes from the caldron ahead Whitley watched intently. "Watch the sheet," he warned, without turning his head.

Now!

With deceptive deliberation he pushed his tiller to starboard. "Sheet!" he bellowed. The cadet whose post it was hastily pulled it taut. *Jane Elizabeth* heeled over as the wind caught her on the beam, swung to meet the onrushing sea. She and the wave met over the reef. Her nose rose until it pointed at the sky, her timbers and rigging groaningly complained. But she cleared the rocks with feet to spare and then fell into a sickening toboggan down the far side of the watery hill, down and out to the open sea. And when the big wave had passed the trough in its rear revealed the black, jagged teeth of the shoal in all their ugliness, and it seemed to Whitley that they were snarling their disappointment.

But he had no time for the weaving of poetic fancies. He had to decide where they were going—and why. Ahead, although not visible with his present height of eye, was the long archipelago that had been seen from the time when the weather was moderately clear. It was doubtful indeed whether its natives, if any, would prove any more hospitable than the first Venusians of his acquaintance had been—but there would be the chance of piracy and plunder. Before undertaking a long voyage he would have to explore the possibilities of living off the country. While he pondered thus his glance roved constantly, subconsciously. He took in the set of his sail, considered improvements that would have to be made. He glanced now and again at his compass, kept the lubber's line on the florid hieroglyph that must represent East. And ever and again he scanned the misty horizon.

Suddenly, he stiffened.

"Clarke," he said, "take the tiller, will you?" He gave the lad brief instructions on how to steer. He shouted for a pair of glasses. Then he looked long and steadily to the north.

"Strange," he said at last. "They're getting out by sea—but that was to be expected. Three sailing boats and—a steamer. Wonder where she's from."

"Nothing marvelous in steam," said somebody.

"No. But it's the thing she's towing. It can't be—"

"It is," said Leonora. Then—"I'm sorry. I should have told you before. But there hasn't been time.

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somehow. But they had a rocket-ship in that harbor of theirs—a Russian. What shape she's in I can't say—but theirs was the last expedition to Venus. So she hasn't been here more than a year."

But Whitley ignored her. He was looking at the little convoy with which he was steering a parallel course. Strangely enough he looked at the steamboat with more interest than the spaceship. He watched her jealously, covetously. With steam and steel under his feet he could make himself undisputed master of the Venusian seas.

The drizzle became a thin rain and then ceased. Visibility was as good as it ever would be on Venus, and he was able to see things in better detail. On Earth the little, smoke-belching ship would have disgraced a slow, tramp convoy. She relied on paddles for propulsion, and as she rolled in the low swell sweeping down from the north her side wheels kicked and splashed with a foaming futility. She had a long, thin smokestack just abaft the paddle boxes, its top surmounted by some kind of spiky, allegedly decorative coronal. What she was burning Whitley could not say, but the dense clouds of black smoke billowing from her funnel argued incomplete and inefficient combustion. Yet to the man from the age of mechanically propelled ships she was more beautiful than the cleanest, sweetest clipper that ever ran the Easting down. Two sinister shapes, one forward and one aft, that could only be cannon made her even more desirable.

Whitley ordered his jib hoisted. Now he had a purpose, now he could crowd on canvas. He satisfied himself that the foot of the triangular sail cleared the Venusian catapult on *Jane's* foredeck, then told those who had practiced with that weapon to ready it for action. He went aft again. He was confident that if he came up into the wind he could sail far closer hauled than the Venusians with their clumsy sail plan—the steamer, of course, had freedom of action. But she was hampered by her tow. Unreasonably, he gave the natives credit for human ethical ideas, assumed that she would stay to protect her charges. And in this he was right.

Jane Elizabeth was cleaner than those who—but a short time past—had been her sisters. Her sails were better designed; and from her lee gunwale had been lowered a contraption made from sweeps and wooden planks—a leeboard. In the absence of a keel this served to keep her from drifting sideways as the others were doing. They, made fearful by the strange changes that had been wrought in the appearance and capabilities of one their number, tried to edge up into the wind. But they made more leeway than headway.

Had Whitley been the Venusian naval commander he would have ordered the sailing ships to fall back, to seek protection behind the guns of the slow, waddling steamer. But they made no attempt to heave to or to shorten sail. Whitley saw the little figures of their crews bending

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on all sorts of rags and scraps of canvas in a vain attempt to pull themselves away from the avenging Terrestrials. But he was disposed to let them escape. He wanted the rocketship—or the steamboat?—and could not be bothered to waste ammunition on these small fry. They were neither dangerous nor desirable.

He gave his riflemen instructions. "Any time you like now—aim for the bridge! Yes, that's it, that kind of platform between the paddle boxes." He looked aloft. Illogically, he wished that he had some kind of ensign at the peak. The illegality of opening fire without one's national colors displayed had been so drummed into the seamen of his age that a display of bunting on these occasions had become almost instinctive.

Before his rifles started their rattling song the drums aboard the Venusian ships awoke into staccato life. Obviously, orders were being passed between the vessels. As one their three huge crossbows fired, the bolts falling almost simultaneously in *Jane Elizabeth's* wake. It seemed that the batrachian gunners had not allowed sufficient deflection, had made too low an estimate of *Jane's* speed. But that mistake would not be repeated too many times. He gave an order to Clarke, who was still at the tiller, let the ship's head fall off from the wind a little. The change of course and rate of advance should help confuse the others. "Go for the sailing ships first," he ordered. "Sweep their decks—and put those blasted catapults out of action!"

That part of the engagement was almost too easy. The little rocket projectiles swept the crowded decks clear of life, brought clumsy sails down with a run as rigging was cut to flying shreds. In seconds the three enemy ships were reduced to lifeless hulks, wallowing in the long, low swell.

Whitley swept ahead of them, put down his helm and came round to the starboard tack. He was afraid that the almost untried *Jane Elizabeth* would find herself in irons, but thanks to his skillful handling of the jib she came round easily. He let her fall off from the wind until it was almost abeam, until his course was parallel with but opposite to that of the steamer and her tow.

He saw with approval that Stanley, who was self appointed gunnery officer, was directing a rapid and accurate rifle fire at the sidewheeler. Figures ran along her deck to try to reach the forward cannon but fell, one by one, whilst still yards from their objective. But— "Their bridge seems to be armored!" shouted the cadet. "We can't make any impression."

Looking through his glasses Whitley saw that this was so. Just forward of the funnel—now visibly perforated—was a box that could only be the Venusian's wheelhouse. He saw the rocket bullets striking with vivid gouts of flame, but saw no evidence of penetration. "Try the big crossbow," he shouted. "And the best shots can try to get their fire through those slits or peepholes!"

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By this time he was almost abeam of the other. It occurred to him suddenly that there was no reason why the after gun should not be manned and ready, should not be trained round as far forward as it would bear. "Ready about!" he shouted. Then— "Down helm!" As *Jane Elizabeth* came round to the port tack once more he hoped that her crew now realized the value of the long, sweltering hours they had spent at sail drill before their ship was launched.

Before the sails filled on the fresh tack came a peculiar, dull detonation from the paddle steamer. It was like nothing so much as the soft explosion heard when overmuch pressure lifts the cap of a safety valve, or when a boiler gauge glass decides to blow.

He could see the gun now, he seemed almost to be looking down its muzzle. A cloud of white steam was slowly dissipating in the humid air. Out on the port quarter a solid projectile skittered from swell to swell, for all the world like a flat stone flung by an idle boy.

"A steam cannon," he said, not without admiration. "And it works."

Stanley was directing *Jane Elizabeth's* fire on and around the gun shields. A figure staggered out from behind that of the forward gun and fell. Nevertheless, both cannon fired again, but their aim was woefully inaccurate. Then *Jane* was out of the field of fire of the after gun once more. On this tack she could not bring her own big crossbow to bear. On the superstructure its bolts had done no damage, but Stanley wanted to see the effect of one in the threshing paddles. But even if she were disabled it would still, thought Whitley gloomily, be stalemate. "We've got good rifles," he explained to Leonora, "and no armor plating. She's got cannon—maybe not very good but good enough to sink us—*and* armor. So what?"

"So what?" she echoed. *"This,* my dear. While you've been playing at admirals I've been keeping a general lookout." She pointed astern. "It seems to me that the shore—or what's left of it—of our late happy home is a lot closer. We're all going astern—and fast!"

The sailor followed her pointing arm. "You're right," he said. He could have sworn that they had been at least six miles from *Martian Maid's* island when he had opened the action—now they were—at most—three. And as Leonora had said, there was not much of the island left. A huge cloud of steam overtopping the volcano told its own story. The sea must be pouring into some enormous cavity that had opened in the ocean bed. It could not be long before the combination of water and volcanic fire produced a truly cataclysmic upheaval. It— A cannon ball fell just under the poop, the shower of spray drenching the three who stood there. "Ready About!" ordered Whitley automatically. Then— "No. I'll wear ship." Clarke put up the helm and brought the wind to the port quarter.

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"What are you going to do?"

"Bring my crossbow to bear and put a shaft in his port paddle. Then ram and board!"

Mutely, she pointed again to the billowing clouds of steam, to the swirling vortex which even now was visible.

"I know. I could clear out to the south'ard, he could cut his tow and run any way he pleases. But we're both of us too stubborn. And I can't lose the chance of getting that rocketship!"

As *Jane Elizabeth* swept down the wind, the murky air ahead of her alive with tracer, the Venusian made no attempt to take avoiding action. Stolidly, she paddled on, for all the world like some ugly, deadly serious water beetle. Intermittently the two steam cannon spoke, but their crews were obviously inconvenienced—at least—by the concentrated rifle fire. Perhaps such sights as they possessed had been broken or deranged. Whitley saw Stanley forward, busied with the big crossbow. He laid and trained himself. "What are you waiting for?" shouted the sailor. "Wish you'd keep the ship still, sir," grumbled the other. Whitley thought that the swell, which was now almost astern, made it hard for one not trained in the art of naval gunnery to gauge the right moment to fire. But Stanley had managed quite well before. It was then that he realized that *Jane Elizabeth* was trembling continuously and rhythmically. He looked down at his feet—the seams of the deck planking were opening. Somebody poked up his head from below. "Dale! Dale! She's leaking like a basket!"

It could be, he thought, some effect of the undersea eruption. Experimentally, he ordered Clarke to swing a point off his course. The trembling ceased. A second or so later it started again—slight at first then rapidly growing in intensity. Between the two ships—and between the two ships only—the surface of the sea was strewn with dead and dying water things. It could only be some kind of sonic or supersonic beam projected by the Venusian—a directional submarine resonator. It was an effective weapon.

If he zigzagged he spoiled the aim of the unseen operator—but he was also reducing his own speed. And he had no time to spare. The roar of the maelstrom was now loud in all their ears—and one by one the three derelicts had been sucked into its boiling depths, sweeping round and round in rapid, ever diminishing circles before vanishing into the clouds of steam and spray. Besides, *Jane Elizabeth* was making water fast and—almost worse—becoming sluggish.

He called to Stanley: "If I throw her out of the beam again, can you fire?"

"I think so!"

For the last time *Jane* swung from her course. From forward came the loud twang of the suddenly released bowstring. Straight

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and true sped the shaft, to fetch up with a horrid grinding clangor in the flailing paddles. What happened then can only be explained by the assumption that the Venusian engineer had raised a head of steam far in excess of the strength of his boiler plating, that he either had no safety valves or that they were not functioning. The port paddle was reduced in scant seconds to a twisted mass of wreckage defying the already overstrained engines to shift it a fraction of an inch. The starboard wheel raced madly, the ship swung to port and, had she continued on her course, must inevitably have rammed *Jane Elizabeth*. With almost half of the machinery not working pressure mounted rapidly and catastrophically in the boilers. It was a slow, leisurely, sort of explosion. Tiredly and ludicrously the long, thin funnel bowed and toppled. Where it had been a pillar of steam and wreckage climbed into the low sky. The hull seemed to cave in, stem and stern lifted from the water, hung for a while like two upraised arms, then vanished. And then there was nothing but a few swimming figures paddling frantically and in vain away from the hell of elemental fire and water opening behind them.

When Whitley brought *Jane Elizabeth* alongside the Russian rocket she was going down fast. Her decks were crowded, for the rapidly encroaching water had made the holds untenable. It was not easy for the crew to obey his shouted orders, but in spite of the congestion they managed to get the sails down, to snatch the tow line that still dangled from the Russian's fins.

Crippled ship of the sea and sleeping ship of space were already commencing the first, sweeping circle of the vortex when Stanley, who had scrambled on to the slimy hull, managed to get the air lock door open. Ordinarily the research ship would have been boarded with caution—but under these circumstances caution availed nothing. *Jane Elizabeth* was going fast, and the spaceship offered at least temporary refuge. And if her interior held unpleasant surprises—the certainty of the boiling whirlpool, the sure prospect of world-rending explosion, were more unpleasant than anything she could offer.

Whitley stood on his deck watching the survivors of *Martian Maid*, one by one, jump or step cautiously across the space between the two ships, scramble over the slippery, curved hull to the air lock door.

"If her engines aren't in working order," he thought, *"I'll stay here. May as well go down with my first, and last, command. You did well,* Jane Elizabeth—" With his right hand he patted the tiller, then grasped the hard, unyielding wood firmly. "And I'll stay with you," said Leonora beside him. He started, he was not aware that he had given his thoughts utterance. She slipped her hand into his free one. Jane and Leo, he thought.

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Funny that I should have them both with me at the finish. It was very hot, and the fog of sulphurous steam made them cough. The hot water crept over their ankles.

It was not quite scalding.

"Come on, you two!" It was Pawson, emerging briefly from the air lock. "She seems to be in perfect order!"

And yet they could not hurry. Some premonition, some warning instinct, made them savor each and every moment to the full. Slowly, reluctantly, Whitley released his grip on *Jane Elizabeth's* tiller and, hand in hand, he and Leonora stepped from the sinking deck to the smooth, slimy plating. With what was almost a tired sigh the little ship went down, but for seconds her mast protruded above the surface of the water, moving with slow deliberation like a beckoning finger. "She wants you," said Leonora jestingly. Then, bitterly, "*She* wants you."

"Hurry up!" bawled Pawson.

He was almost beside himself with impatient anxiety when they finally made the air lock. He dragged them inside, then went hastily to the controls that closed the outer door. He left them there, and they heard his feet hurrying along the alleyway to Control.—This was his world, his job.

Whitley let his legs sag. He slid down the bulkhead until he was in a sitting posture. By his side he felt Leonora do likewise. They felt the deck beneath them tilt slowly and steadily. Leonora clutched his arm. "Is this . . .?" "No." He spoke with calm conviction, although he never knew from whence came his knowledge. "These research rockets are made to take off from anywhere, if it's water they tilt the nose to the right angle with ballast tanks aft. Stanley is taking her up. He is always reading books on exploration—he knows as much about these ships as the people who built them, the people who sailed them."

And then, from beneath them, came the thunderous murmur of unleashed power. It seemed that the gentle acceleration pressed them together. His arms were around Leonora, and hers were around him. This was the end of the story. Now he could sleep. But first— He looked into the girl's eyes, and she looked into his. Now, with her face smudged and dirty, drawn and tired, she was infinitely more human, more desirable, than the glamorous creature he had first known. Her grip about him tightened. Her lips were slightly parted. "My—"

"—darling," he said. Like a frightened child Jane clung to him. Temporarily, she was a child. Like most self-reliant persons, her dearest dream had been that of complete dependence.

The scene was unfamiliar, yet familiar. It seemed to be a flat roof somewhere in London. In one corner a vagrant eddy played with a handful or so of very fine metallic dust. And there were men, high

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officers of all the services and civilians, drifting about aimlessly, lost in their snug, happy little wish-fulfillment-dream worlds. Whitley heard an Air Marshal say: "Where are the stumps? Where are the stumps? I can't have been bowled first ball—"

The scene was familiar.

Whitley smiled a little bitterly. This is where I came in, he thought. I have been here before. But what has Quentin Dale being doing? A burst of gunfire from the north refreshed his memory of this, his twentieth century life. It was less real than the other had been. Even Jane, in his arms, had less substance than the memory of Leonora Starr. Overhead, looking more like a cheap, ugly children's toy than the deadly weapon it was, sailed a robot bomb.

He listened to the noise of its motor receding in the distance, heard it cut out, waited tensely for the explosion.

His arms tightened around the inarticulate Jane. He looked again at the scene of confusion on the rooftop. He smiled. In spite of the credit that must accrue to him from the Venus adventure Quentin Dale would never be able to convince the examiners that he knew his magnetronics.

THE END.

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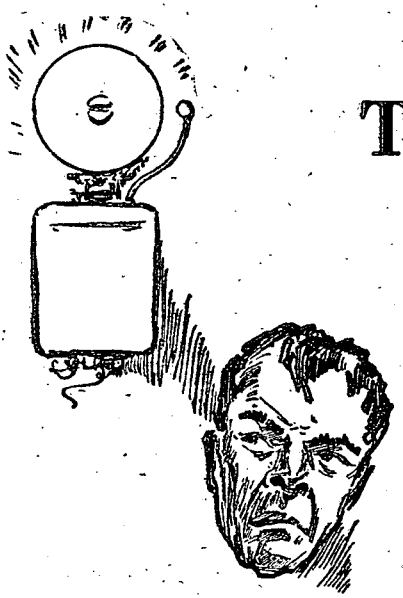

This Is The House

by
LAWRENCE O'DONNELL

Illustrated by Kramer

A house, it has been said, is a machine for living. The house they bought from its previous occupant had, very definitely, been made just that. But—not for human living!

Melton walked somberly into the living room and headed for the front windows, where he remained, brooding over some dark thought and twisting his hands idly behind him. His wife, Michaela, lifted her head and watched him, while the whirring of the sewing machine faded into silence. After a moment she said "You're in my light, Bob."

"Am I? Sorry," Melton murmured, and moved aside. But he still kept his back to the room, and his fingers still moved nervously behind him. Michaela frowned, sent a slow, rather questioning glance around the room, and pushed back her chair.

"Let's have a drink," she said, "Your silhouette looks vaguely rocky. A short, strong cocktail, perhaps . . . huh?"

"A short, strong snort of rye, I'd say," Melton expanded, brightening a trifle. "I'll fix it. Hm-m-m." He had taken a step toward the hall door, but now he paused, almost imperceptibly. Michaela remembered the refrigerator then. "I'll do it," she said, but Melton growled something and went on out, his footsteps heavy and determined.

Michaela crossed to the divan

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under the window and curled up on it, biting her lower lip and listening hard. As she expected, Bob was delaying opening the refrigerator. She heard the rattle of glasses, the clink of bottles, and a gurgle. The last time Bob had had occasion to investigate the refrigerator, there had been a gasp and a string of blazing, subdued oaths. But he had refused to tell why. Remembering other incidents that had occurred in the last three days, Michaela moved her shoulders uneasily. Not that she was cold. The house was warm, almost too warm, and that in itself, implied certain disturbing factors they had already noticed. Because the coal furnace in the basement was working rather impossibly well.

Melton came back with two highballs. He gave one glass to Michaela and slumped into a chair near her. There was a long silence.

"O.K.," Melton said presently. "So I didn't put any ice in the drinks."

"What of it?"

"Because there's ice today. There wasn't yesterday. But today the ice-trays are full. Only it's red ice."

"Red ice," Michaela repeated. "I didn't do it."

Her husband looked at her darkly. "I made no accusations," he pointed out. "I didn't really think you cut a vein and bled into the ice-trays, simply to worry me. I'm just saying that the ice is red now."

"That's easily solved. We'll drink the rye straight. Where's the bottle?"

Melton produced it from behind his chair. "I thought we could use several. Did you phone the agent today, Mike?"

"Yes. Nothing came of it. He got the idea we had termites."

"I wish we had. Better termites than . . . well, what about the former tenant? Hadn't he been able to find out anything at all?"

"No, and he thinks we're busybodies."

"I don't care"—Melton took a long swig from his glass—"what he thinks. We bought this house on the understanding that it wasn't . . . wasn't . . ." He slowed down and stopped. Michaela exchanged a long glance with him.

Melton nodded. "Sure. That's the way it is. What *can* we say?"

"Harmon kept talking about electricians and plumbers. He recommended several."

"That helps a lot."

"You're a defeatist," Michaela said, "and give me another drink. Thanks. After all, we're saving coal."

"At the expense of my sanity."

"Could be you don't understand this sort of furnace."

Melton put down his glass and glared at her. "I've handled furnace accounts at the office." He worked with a New York advertising agency, which was one reason they had taken this house, half an hour from Manhattan and pleasantly isolated on the outskirts of a small Hudson River town. "I've had to find out a little about how they worked. There's a place for a draft, there's a vent where the gases go out, and there's a boiler

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built into the furnace. You put coal in, and, presumably, it burns out, heats the water in the boiler, and is circulated through the house radiators. There's also a blower that doesn't work. Look. It you light a match, it burns up, doesn't it?"

"Yes. It burns up."

"But the coal doesn't," Melton said triumphantly. "Three days ago I put a couple of shovels of coal in the furnace. I've had a red bed of coals ever since. The house is warm. It shouldn't be." He reached over to an end table and scrabbled at some papers. "I even figured out how long it should have taken the coal to burn. The answer is four hours at the outside. Not three days."

"What about that automatic stoker idea?" Michaela asked, "Did you look?"

"Well, I didn't use an X ray. But I looked. Yeah. I'll show you." He stood up, seized Michaela's hand, and they headed for the cellar, by-passing the eccentric refrigerator.

The cellar was capacious, cement-floored, and with six-by-six vertical supporting beams here and there. In one corner, by the coal bin, was the furnace, a bulging, dirty-white object with insulated pipes sticking out of it and wandering across the beams of the ceiling. All the draughts were shut, but the hydrostatic thermometer atop the boiler read 150. Melton opened the metal door. The bed of coals glowed red; ripples of wavy heat-motion ran across its surface.

"Where's the stoker?" he asked.

"Built in," Michaela suggested hopelessly. "It's a big furnace."

"The boiler's like a jacket. That fattens it out."

"Why not let the fire go out and start another? Maybe—"

"*Let* it go out? I can't *make* it go out. I can't even shake it through the grate." He seized an iron crank and demonstrated. "The house is too hot, even with all the windows open. When snow sets in, I don't know what we'll do."

Michaela turned abruptly toward the stairs. Melton said, "What's the matter?"

"The doorbell."

"I didn't hear it."

On the landing, Michaela paused to look down at her husband. "No," she said reflectively, "one doesn't. Hadn't you noticed?" She made a despairing gesture and departed, leaving Melton to stare after her. Now that he thought of it, not once in the past three days had he heard the doorbell ring. Yet, he recalled now, there had been callers—mostly salesmen determined to sell the new tenants insulation, paint jobs, extermination equipment, and subscriptions to magazines. Somehow it had always been Michaela who had answered the door. Melton had taken it for granted that he had been in a part of the house where it wasn't easy to hear the bell.

He scowled at the furnace, his thin, saturnine face set in troubled lines. Very easy to say, "Ignore

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the matter." But you couldn't. Not even the single matter of the furnace. And there had been others. What was wrong with the house?

Superficially nothing. Certainly nothing that a prospective tenant would notice on inspection. The title search had showed no flaws; an architect had approved Melton's plan to buy the place. So they had moved in, grateful for a *pied a terre* after months of vain house-hunting. During the war, when economic masses were artificially migrated, rents soared and housing was a vital problem.

But 16 Pinehurst Drive seemed exactly what they wanted. It wasn't ultra-modern; it had a certain solid air of assurance about it. It had sat for fifteen years facing the Hudson Palisades across the river, like a prim dowager austerely gathering gray stone skirts about her. The foundation was stone; the upper stories—it was a two-story house—were wooden frame. And the layout of the rooms was ideal for their menage, Melton and Michaela and her brother Phil, who lived with them when he wasn't off on a binge, as he was, presumably, at present.

So they had moved in, the furniture had been installed, and the trouble began. Melton wished Phil were here. The guy, for all his erratic tendencies, had the ability to take things for granted; he exuded reassurance. But Phil hadn't even seen the new house yet.

He did not, therefore, know about the hall light, upstairs, which after a few experiments the Meltons had decided not to use at all. There was something about it. It altered complexions oddly, and had a quality of semifluorescence. Not quite that, but neither Michaela nor Melton liked to see each other in its illumination. The bulb wasn't at fault; they'd tried several—new ones at that—and the quality of the light was unchanged.

Now why in the devil—?

Yesterday, when Melton had gone to the refrigerator for ice cubes, he had got a tremendous shock. Electrical disturbance of some sort, obviously; but to see an aurora borealis effect in your refrigerator is inevitably disturbing. And there were other things, shading into subtleties of sensation and emotion, that couldn't be captured in words. The house wasn't haunted. It was rather, Melton felt, simply too efficient—in an extremely off-beam way.

The windows had been hard to open, extremely hard—for a while. Then, without any particular reason, they had all yielded as though greased, just in time to prevent the Meltons from dashing out of their overheated house to get a breath of fresh air. Melton decided to look up a friend, whom he'd met while handling the Instar Electric account. The man was a technician of some kind, and might be able to explain a few puzzling matters. Like the mice. If they were mice. There was something scuttling around at night, certainly too small to be a troll Michaela contended, and the traps Melton set caught nothing.

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"Not those mice," Michaela had remarked. "They're too smart. One morning you're going down in the cellar and find a trap reset, with a tiny glass of whiskey as the bait. That'll be the end of you."

Melton was not amused.

A shrunken little man in baggy pants and a suede jacket appeared suddenly on the staircase landing and looked at Melton. Melton looked back in a baffled manner.

"Furnace trouble, huh?" the man said. "Your wife said you couldn't figure it out."

Michaela came into view. "This is Mr. Garr. I phoned him today."

Garr's leathery face cracked into a grin. "Got my name in the phone book under about everything," he said. "Wiring, plumbing, painting—plenty of folks get trouble that ain't just in one line. Like your furnace." He walked over to examine it. "Tinsmith—furnace man—electrician—you got to be all of 'em to get along. What's the matter with the thing?"

"The blower doesn't work," Melton said, avoiding Michaela's accusing stare.

Garr used a flashlight, traced wires, and did things with a screwdriver. Sparks scattered. He finally examined the hydrostat atop the boiler, lifted its cap, and clucked. "Leak," he said. "See the steam coming out? All rusted. The wires are grounded."

"Can you fix it?"

"Gotta get another hydrostat. I'll pick one up, Mr. . . . uh . . . Melton. You don't need a blower much anyway. That all?"

Michaela said firmly, "No, it isn't. We put a few shovels of coal in that furnace three days ago, and it's still going."

Garr didn't seem impressed. He looked into the furnace, nodded in a pleased sort of way, and asked, "How many shovels didja say?"

"Four" Melton told him.

"Ain't enough," Garr said helpfully. "You keep the coal a few inches lower than the door, see? That way, you get better heat."

"The house is too hot now. How do you make a furnace go out?"

"She goes out. Just leave her alone. Or shake her down through the grate."

"She won't shake. Try it yourself."

Garr tried it. "That's right. Guess she's fused. I'll have to get some tools and new grates to fix that, maybe." He straightened and peered around the cellar. "Darn nice house you got here, though. She's well built. Good, solid beams."

"Mice," Melton said.

"Li'l field mice. You get 'em all around this part of the country. You keep a cat?"

"No."

"Keep one," Garr advised. "I got one, but she's always having kittens. Next time she has a batch, I'll save one for you. Yep, you got a nice house here. Anything else need fixing?"

Melton refrained from mentioning that Garr hadn't fixed anything yet. "You might look at the refrig-

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erator," he suggested. "It's been giving some trouble."

Upstairs, in the kitchen, the refrigerator looked as though butter wouldn't melt in its mouth, which was true. The ice cubes were still red, but Garr no doubt decided the Meltons were freezing strawberry pop or cherry juice. He produced a can of oil and squirted some into the motor. "Don't ever use heavy oil on this," he observed. "She'll gum up on you." He indicated bottles of beer in the refrigerator. "Good brand, that. I always get it."

"Have a glass," Melton said. He poured for the two of them. Michaela refused beer and went in search of the dregs of her cocktail. Melton perched himself on the edge of the sink, kicking his long legs idly, and watched the refrigerator balefully.

"I was thinking there might be a short somewhere," he suggested. "I . . . uh . . . got a bit of a shock when I opened the thing yesterday."

Garr set down his glass. "Yeah? Let's see." He unscrewed the metal wall plate and blinked at what he saw. "Funny. I never saw a hook-up like that."

Melton leaned forward. "That so?"

"Hm-m-m. She's D. C., but—somebody screwed this up for you, Mr. Melton."

"How?"

"Amateur electricians," Garr said scornfully. "What's this wire doing here? And this thing—what is it, anyhow?"

"Plastic?"

"Part of a thermometer, maybe. *I* dunno. Hm-m-m." Garr wagged his head, made sparks fly with his screwdriver, and jerked a little. "I better throw the switch."

"I'll do it," Melton said. He went down into the cellar, studied a few fuse boxes, and located the master switch. He threw it to the Off position, yelling the news up to Garr. After a moment Garr yelped. Footsteps sounded on the stairs.

Garr, rubbing his hand, appeared. "You didn't throw the switch," he said reproachfully.

"Sure I did," Melton said. "Look."

"Oh. Yeah. Well, maybe . . ." He fumbled around. Presently he unscrewed some of the fuses. "You go up in the kitchen and lemme know when the refrigerator stops working. I plugged it in again."

Melton obeyed. Michaela came to watch. "Find anything?" she asked.

"I dunno," Melton said, listening to the low purr of the motor. "The previous tenant probably rewired the house."

"Who was he?" Michaela murmured. "Einstein? Or a Martian?"

"Probably a ham electrician who thought he knew more than he did."

Michaela stroked the sleek white enamel of the refrigerator. "Only two years old. It really hasn't been weaned yet, Bob. The wrong kind of juice might upset its digestion."

"If I had the variety of food inside me that that icebox has in

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its innards, I'd be screaming for soda bicarb," Melton said. "Hello, Mr. Garr. Fix it yet?"

Garr's withered brown face looked troubled. "She's still running, huh?" he remarked. "Never stopped once?"

"Not once."

"She ain't on any of those fuses, then. I'd have to tear down the wall to trace the circuit." He looked doubtfully at the wall socket.

"Listen," Melton said, "I've a pair of rubber gloves somewhere. Would they help"

"Yep," Garr nodded. "I'll just finish my beer while you get 'em. Goes flat in a hurry, don't it?"

"Mike," Melton said, "replenish Mr. Garr's glass." He departed.

"Yep," Garr said. "Mm-m . . . thanks, Miz Melton. You got a nice place here. I was telling your husband. Well built."

"It'll do, for a while. Later on I want to get a lot of new stuff in the kitchen. Those glass-fronted ovens and refrigerators—you know?"

Garr made a face. "I seen the ads. Ain't practical. Glass," he said plaintively, "what's the use of it? O.K. to let the sun in, maybe, but—nuts, if you'll pardon the expression, Miz Melton."

"Sure," Michaela said.

"A glass front on the icebox. She'll frost up. Same with the oven—steam. Might as well have good, solid metal. Visible this, visible that, all over the kitchen." He pointed to a metal container on the floor. "Visible garbage. That's where it'll end."

"I could do without *that*."

"All that stuff's O.K., I suppose, but the average guy won't want it. *I* wouldn't. I got my house fixed up the way *I* want. I'm handy around the place. Got my lamps rigged so they'll slide up and down their poles. Fixed a cut-off on the phone so I won't be bothered nights. A man monkeys around his house and fixes it up to suit himself."

"Here're the gloves," Melton said, coming back. "I think you can pretty much tell what a man's like by seeing where he lives."

Garr nodded emphatically. "That's right. A place fixed up like in one of them home furnishing magazines—it may be pretty, but you don't dare set down in a chair without dusting your pants."

"Well," Michaela said practically, "this house was empty when we moved in."

"First time I've been in it for ten years," Garr said. "People named Courtney lived here then. Contractor, he was. The whole family went to California, and a guy named French moved in."

"What was he like," Melton asked quickly.

"I never seen him. He didn't go out much."

"He never called you for repair work?"

"Guess he did it himself," Garr said, with a scornful look at the wall socket. "I'll fix *this*." He did, with swift accuracy. After he had screwed the plate back in and plugged the socket into place,

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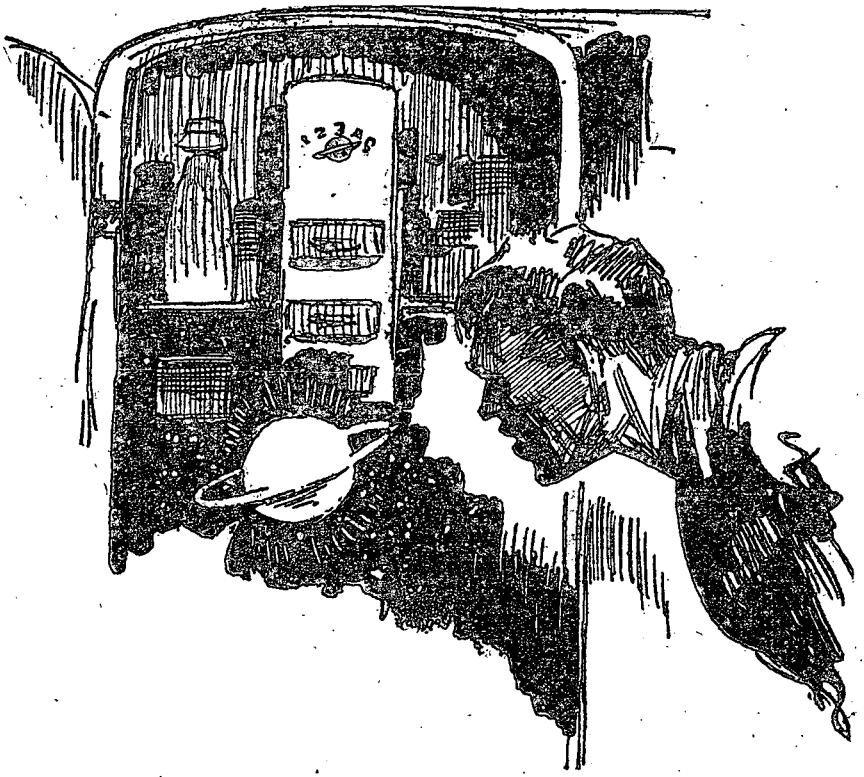

he stood up with a grunt. "That'll do it. Anything else?"

"The bell."

"Won't she work?"

"Not exactly," Melton said. "That is—"

"Mind going out and trying her?" Garr suggested.

"O.K."

Michaela watched Garr. After a few seconds Garr gave her a quick glance. "She's all right," he said. "No short there, anyway."

"You, uh, heard the bell?"

"Sure I heard it. Why? Didn't you?"

"I . . . yes, I heard it," Michaela said, though she had only felt it.

"It works now, Bob," she added, as Melton came back into the kitchen.

"It does?"

"Right as a trivet," Garr said. "Well, I'll be getting along, then."

"What do I owe you?" Melton asked.

Garr named a low sum. Melton paid it, they had another beer, and Michaela said, "There's the bell. Excuse me."

Melton finished his beer in a hurry. He hadn't heard anything. Michaela reappeared, said, "It's Phil. He wants a drink," and left the cocktail shaker on the sink. Garr shook hands cordially and

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departed. Melton sighed, glanced up thoughtfully at the bell annunciator on the wall, and opened the icebox. A ghastly blue radiance hit him in the face. His left hand, outstretched to seize a tray of ice cubes, started to tremble. The skin and flesh was gone from it. He slammed the door, then looked at his hand again. It had returned to normal.

Melton picked up a bottle, several glasses, and went into the living room, where Phil Barclay, his brother-in-law, was slouched casually on the couch. Phil was a small, slender man of forty, immaculately dressed as always, with a round, mild face that was slightly bloated at the moment. He cocked a blond eyebrow at Melton.

"Straight, Bob?"

"Straight," Melton said grimly. "You'll take it and like it."

"I always do," Phil said. He poured whiskey down his throat, shivered, and relaxed. "Ah. A hair of the dog. Oooh."

"Hangover?" Michaela asked sympathetically.

"Certainly," Phil said with dignity, fumbling in a pocket. He handed a folded paper to his sister. "Here's the check on 'Nymphs Secret.' Wesley had it for me down at the gallery Friday."

"Not bad at all," Michaela said, examining the check.

"Not bad for a week's work on that canvas. Well, put it in the family fund. No more work for me for months at least. Another drink, please."

"You look like you've had plenty," Melton said.

Phil gave him a long, probing stare. "You don't look too good yourself," he said. "In fact, you're sweating."

"It's hot."

"It's *too* hot," Phil agreed. "You'll use up all the coal in a month at this rate. Or is it oil?"

"Coal," Melton said, "and we won't use it up. Not in *this* house."

"I don't like it either," Phil said unexpectedly. Michaela put her palms together and leaned forward.

"What is it, Phil?" she asked.

He grinned. "Nothing. This is the first time I've been inside here, you know. No, I don't want to look around. I . . . came up here day before yesterday."

"Weren't we home? You had a key, though."

"I had a key," Phil said staring at nothing, "but I decided not to use it. The bell wasn't working, so I knocked on the door. Then—"

Melton's tongue circled his lips. "What happened?"

"Nothing," Phil said flatly. "Nothing at all."

"Then why—"

"I was a little high. I was jittery. There weren't any ghosts. There was—" Phil paused. "I really don't know, Bob. But I decided to go back to town."

"Were you afraid?" Michaela asked.

Phil shook his head. "That was odd. I wasn't afraid, really. There was nothing to be afraid of. I simply decided against coming in."

"But why?" Michaela wanted to

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know. Her voice was high-pitched. "That's no reason, and you know it."

Phil poured the last drops from the bottle, and held it up. "See this! It's empty. But you know what's been in it. You can smell the whiskey."

Melton slammed his fist down on his knee. "That's it," he snapped. "That so-and-so French! Who was he? And what did he do to this house? Hex it?"

Quite suddenly there was a sound, a mournful, hooting cry with a curious timbre of hollow distance. Melton felt a second's disorientation. Then he identified it; a tug, on the twilit river.

"You've got it bad," Phil said quietly. "If *that* can make you jump—"

"So I need a sedative. I've been working hard."

"Well," Phil said, getting up, "I guess I'll look around the joint, after all. Stay put, Mickey. I'll find my way. O.K., if you insist, Bob."

They went through the house. Melton said very little, but he switched on the light in the upstairs hall and waited for Phil's reaction. Phil didn't remark on it. But he was oddly intrigued by the cellar. He poked and probed around there a good deal.

"What are you looking for?" Melton inquired. "A secret vault?"

"Huh? Well, no." Phil gave a last, long look at the bare wall and headed for the stairs. "You say a chap named French lived here last?"

"John French. It's on the title search papers. But as far as I can find out, nobody ever saw French. He had his stuff delivered. Never had any mail. No telephone."

"What about recommendations? He must have had some when he moved in."

"Ten years ago. I checked that, too. Ordinary stuff—a bank, an attorney."

"Profession?"

"Retired."

Phil experimentally turned on the sink faucets. "It's a . . . bad house," he said. "Yet it isn't haunted, or evil, or anything in the Gothic line. Why is it so hot?"

Melton explained.

Then, on impulse, he looked up, through the open door of the kitchen. In the dining room adjoining someone was standing motionless watching him. His reaction, he felt with curious objectivity, was extremely odd.

For, at first, after a very brief doubt, he felt that the figure's presence was normal enough; his racing mind jumped at logic—a delivery boy, the mailman—and then, instantly after that, came a shocking sense of utter disorientation and realization that the person in the next room didn't belong there. Hard on the heels of that jarring impact came the sudden knowledge that the silent figure was—

Was Michaela.

That was the worst of all. He hadn't known her at all. For that short, shocking passage of time, he had seen her as a total stranger. His stomach was sweating, and he felt

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his heart pounding. The whole incident was over so quickly that no one noticed; Michaela came on into the kitchen, and Melton turned hurriedly to get a fresh bottle out of the cupboard.

"How do you like the place?" Michaela asked. Phil smiled crookedly.

"Very efficient," he said, and Melton swallowed.

"Do you believe in the psychic impregnation of the inanimate?" Phil asked two days later, as he pushed a pillow under his head and curled up on the couch.

"What?" Melton said. It was early morning, and Melton was drinking coffee and watching the clock. They'd brought out the tiny alarm clock, since the electric model didn't run too well.

"An old, old theory," Phil said lazily. "If a man lives in a house for a long time, his psychic emanations seep into the walls and spoil the wallpaper. Or something. You know."

"No," Melton said. "Shut up. I've got a headache."

"So have I. And a hangover, too. Hm-m-m. I can see that a coffin might acquire psychic emanations, but that's merely because it's functional. If a man sees a coffin, he knows what it's for."

"I'd like to see your coffin," Melton remarked without malice. "And you in it."

"Well, I thought you'd like to know I didn't believe in that crap either. It's my opinion that Mr. French fixed up this house to suit himself. He must have been a strange man. Man? Well, anyhow, have you noticed the woodwork?"

"It's got shellac on it, if that's what you mean."

"It's got something on it, but not shellac. I made some tests. You can't get the stuff off. There's a coating on every inside wall, ceiling, floor, and door in this house. Like insulation."

"Well, it isn't. There isn't even insulation in the attic. Maybe I'll have rock wool put down."

"If you do, we'll roast alive."

Melton was following his own train of thought. "Renovating's what the place needs. I think I'll have exterminators come."

"What for?"

"Mice. In the walls."

"Mice! *Oh,* no."

"What, then?" Melton inquired. "Rattlesnakes?"

"Machinery."

"You're crazy. I went up in the attic and looked down between the walls."

"Did you see any mice?"

"No, but they probably saw me. That's why I didn't see them."

"Now you're confusing me," Phil said unhappily. "Besides, we're not talking about the same thing. I don't mean turbines and dynamos and atom-smashers. Machines can be so simple they're unrecognizable. Like that poker over there."

"That's no machine."

"It's a lever, isn't it?" Phil said, and his brother-in-law snorted.

"All right, so we've got levers in

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the walls. Who uses 'em? That poker won't pick itself up and—" Melton stopped suddenly and looked at the poker. Then he met Phil's gaze. Phil was grinning.

"Yeah," he said cryptically.

Melton rose, flinging his napkin to the table. "Machines in the walls, hell," he remarked.

"Very simple and very complicated. And unrecognizable. Paint is just paint, but you can do a Mona Lisa with it."

"So French coated the inside walls with paint that acts like a machine?"

"Invisible and intangible—how should *I* know. As for those noises at night—" He hesitated.

"Well?"

"I think the house is just recharging itself," Phil said, and Melton fled, muttering under his breath.

He lunched with Tom Garrett, the technician from Instar Electric. Garrett was a fat little butterball of a man with a gleaming bald head and thick spectacle-lenses through which he blinked myopically. And he had little to advise on the matter of the house.

"Well, what have you?" he asked finally. "Some unusual electrical circuits. And, if you want me to be frank—"

"You will anyhow," Melton said. "Shoot."

"—a neurosis."

"Affecting three people?"

"Certainly. A house can do that. Environment is a pretty strong influence. *Br-r-rp*. Excuse me. I'd be more inclined to suggest a vacation or a doctor than a rewiring job."

"I had the place rewired. It didn't make any difference."

"Well, you're not crazy," Garrett said consolingly. "At least not yet. Your skeleton hand in the icebox—you know very well that in a strong light your hand shows translucent. You can see the outline of the bones."

"Yeah. Every time I look out of a window I expect to see something else."

"What?"

"I don't know. Just something different."

"Do you see it?"

After a pause Melton said, "No." Garrett stared.

"I wonder. I'd like to run up and take a look at that wiring of yours."

"Delighted to have you. When?"

Garrett consulted a notebook. "I'm tied up for a bit, but—suppose I phone you?"

"The sooner the better. I'm thinking about moving, anyway, though."

"Where else could you find a furnace like the one you've got?"

"I wish that were as funny as you think," Melton said somberly. "And I'd like to see you check that wiring for me. I've a hunch you'll be surprised. My brother-in-law has even wilder ideas than I have, so—"

"What?"

Melton went into detail.

Garrett was surprisingly intrigued. "You know, his idea about machines isn't at all illogical. The

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farther we go, the simpler gadgets get. The klystron, for example—far less complicated than the average specialized vacuum tube. When we deal with electromagnetic energies, neutrons and so on, we sometimes find that the best sort of machine to handle them is—well, a plain metal bar."

"But—*paint!*"

"I've seen paint that is a machine," Garrett said. "Luminous. It gathers in sunlight during the day and releases it at night. Not that I take any stock in your brother-in-law's theories; I'm just riding my own hobby. Eventually the world of the future—*I* think—won't be burdened with immense, complicated gadgets. Everything will be so simple—or seem so simple—that a man from the twentieth century might find it quite homelike, except for the results."

"Yeah," Melton said. "They'd be a bit different, wouldn't they?"

"Quite a bit, I expect. Well, I must go. I'll give you a ring, Melton. And take my advice and have a doctor check you up."

"Don't tell me I'm sound as a bell," Melton said. "You might be thinking of the Liberty Bell. That's cracked."

Dr. Farr touched his mustache and apparently liked the sensation, for he began to stroke it rhythmically. "How should I know, Bob?" he asked. "Half of my patients are slightly nuts, and, as long as they don't know it, they get along fine. Just a matter of compensation and adjustment."

"Four-bit words."

"By the tests you may be a bit psychotic," Farr said, referring to his notes. "Especially on orientation. That's an especially significant symptom. However, I've known you for years, and I'd stake my reputation, such as it is, that this business is objective and not subjective."

"Then it's the house?"

"That may be the trigger. A fixation. You could have it about anything. It just happens to be the house. Get out of it."

"I intend to," Melton said.

Farr leaned back and looked at his diploma on the wall. "Your friend was right about environment. Lock a kid up in a dark closet, and he's apt to be afraid of the dark ever after. And why? Because it's the wrong environment. If the house makes you nervous, pack up and git."

"What about Mike and Phil?"

"They could catch it from you. Or the other way around. Phil's a dipsomaniac anyway. He'll be heading for D. T.'s presently. Too bad; he's a fine artist."

Melton said, rather defensively, "You know what would happen to Phil if he didn't live with us. And he certainly pays his way."

"When he works. A couple of pictures a year. Ah, well. I'm a doctor, not a reformer. Is he still on his binge?"

Melton scowled. "He hasn't touched a drop for a couple of days. That's funny, too. Because he's high most of the time. I know the signs."

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"Maybe he's got a bottle cached away."

"Not Phil. He does his drinking publicly; he's not ashamed of it. He'll get tanked any time, without apology. That *is* funny, now that I think of it."

"How does he act?"

"As usual. He spends a lot of time in the cellar."

"Maybe there are some bottles down there," Farr suggested. "Don't let him develop any guilt-complexes. Get him to drink with you, if he's got the urge. The psychological angle is pretty important. He trusts Mike and you completely, but . . . well. Tell him to drop in and see me. I want to check his heart, anyway, and I'll buy him a drink at the same time."

"You're some doctor," Melton said, chuckling. "Well, I've got to do some checking up on a man. See you soon."

"Move out of that house," Farr called after Melton's retreating figure. "It's probably haunted."

It wasn't haunted. Yet, that evening, as Melton paused on the porch, his key out, he knew very definitely that he didn't want to go in. He remembered a line from *"de la Mare"*: "'Is there anybody there?' said the Traveler . . . knocking on the moonlit door—" And—how did it go?

"Only a host of listeners . . . listening . . . to that voice from the world of men."

Something like that. Indefinable and intangible, as much so as dust motes in moonlight. Move your hand through the shaft, and there's no resistance; the motes swirl away and return.

Melton grimaced and unlocked the door. In the living room, Phil was slumped on the couch, half asleep. Michaela dropped her sewing and stood up to greet him.

"Anything?" he asked.

"Nothing new," Michaela said. "Let me take your coat. I'll hang it up." She went out. Melton picked up the cloth Michaela had been sewing on; she hadn't got very far. He stared at Phil.

"No remarks?"

"I am happy," Phil said. "No remarks are necessary."

"Have a drink?"

"Nope."

"Doc Farr wants to see you, when you're in town."

"Why not?" Phil said. "Find out anything about John French?"

"Yes. How about that?" Michaela asked, coming back from upstairs. "You said you were going to check up."

Melton dropped into a chair. "I did check up. Through an agency. But it's no use. The guy simply didn't exist. Nobody ever saw him."

"Naturally," Phil said.

Melton sighed. "All right. Who was he? Santa Claus?"

"Timeo Danaos— The furnace is still going strong."

"And it's still too hot. Why don't you open a window?"

"They're stuck again," Michaela said. "We can't get 'em open at all now."

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The lights went on. Melton said, "Did you do that, Phil?"

"No."

Melton went over to the switch and tested it. The lights stayed on.

"Good old John French," Phil murmured. "Good old Jack. This is the house that Jack built. And how!" He rose and went out to the kitchen. Melton heard footsteps on the cellar stairs.

"Yeah," Michaela said. "He's been going down there all day."

"He's high as a kite, you know."

"Of course I know. And—it isn't his usual binge."

"I know it isn't," Melton said. "Well . . . he must get the stuff in the cellar. Maybe Jack . . . maybe French left some bottles down there."

"Of what? Uh! Let's not think about it."

"What did you do today?" Melton asked.

"Nothing. Literally, nothing. I tried to do some sewing, but time passes too fast here. It was six o'clock before I knew it."

"Always tea time. What's for dinner?"

Michaela put her hand to her mouth. "Oh. Beat me, Bob. I forgot about dinner."

"I think you've been in the cellar, too," Melton said jokingly, but Michaela gave him a look of strained distress.

"No, Bob. I haven't—not once."

Melton watched her for a moment. Then he got up, went out to the kitchen, and opened the cellar door. The light was on, and he could see Phil in a corner, standing motionless.

"Come on up," he said. "We'll have to drink our dinner."

"In a minute," Phil said.

Melton went back to the living room. Presently Phil joined them, weaving a little in his walk. Melton nodded darkly.

"This is the rat that ate the malt," he remarked.

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"Oh, don't," Michaela said. "I keep thinking about the man all tattered and torn."

"I keep thinking about Jack," Phil said. "Little man who wasn't there. Out of the everywhere into here. Look, Bob. If you spent ten years with the Ubangis, what would you do?"

"Give up kissing," Melton said.

"No, I mean it. If you had to move into a Ubangi hut and stay there. You wouldn't have anything in common with the natives, would you?"

"No."

"Well?"

"Well, what? What would *you* do?"

"Change the hut a bit," Phil said. "Especially if I wanted to pretend I was a Ubangi, too. I wouldn't alter it outside, but I'd fix it up a bit inside, for my own convenience, and I wouldn't let anybody else come in. Chairs instead of grass mats. I wonder how French had this place furnished?"

"Just who do you think French was?" Melton asked.

"I don't know. I don't think I *could* know, even. But I know what he wasn't."

"What wasn't he?"

"Human," Phil said.

Michaela stirred and sucked in her under lip. Phil nodded at her.

"We're in the house more than you are, Bob. Mickey and I. And it's alive. It's a machine, too. Sort of half and half."

Melton grimaced. "I suppose it's been talking to you."

"Of course not. It wasn't designed for that. Jack didn't build this house, but he moved in, and fixed it up to suit himself. To suit his special requirements. Whatever they were. He liked—or needed—plenty of heat. That's not too far off the beam. But some of the other things—"

"Like the refrigerator," Phil said. "There weren't any marks on the linoleum, and there would have been some, in ten years. I looked. Something else was hooked up to that socket. Rewiring won't help any, Bob. Jack didn't need wires. He may have switched 'em around a bit, for convenience; but I suppose all he had to do was juggle a couple of atoms and—he'd have a machine."

"A living house. Yeah. Nuts."

"A robot house, could be. A robot wouldn't have to look like a man. We've got robots now, really, and they're functionally designed."

"All right," Melton said harshly. "We can move."

"We'd better. Because this house was made for Jack, not for us. It isn't working just right. The refrigerator's acting funny, but that's because it's plugged into a socket meant for some other gadget."

"I tried it in some other plugs."

"Any luck?"

Melton shook his head. "It was still . . . uh . . . funny." He moved uneasily. "Why should French . . . I mean, why would he want to—"

"Why would a white man live in a Ubangi village? To study ethnology or entomology, perhaps. Or

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for the climate. Or simply to rest—to hibernate. Wherever Jack came from, he's gone back there now, and he didn't bother to put the house in its original condition. Yeah." Phil rose and went out. The cellar door closed softly.

Melton went over to Michaela, knelt, and put his arm around her slim shoulders, feeling the yielding warmth of her. "We'll move, darling," he said.

She stared out of the window. "It'd be so lovely, if . . . well. The view's magnificent. I wish we didn't have to move. But it's the only thing. When, Bob?"

"Want to start looking for another place tomorrow? A city apartment, maybe?"

"All right," Michaela said. "A day or so more won't make much difference, will it?"

He could hear Michaela's soft breathing beside him, there in the dark. He could hear other things, too. They were not mice, he knew. Within the walls, there was a subtle, slow movement, at the threshold of hearing and consciousness. The house was recharging itself. The robot was preparing itself for the next day's work.

It was mindless; it was not alive; it had no consciousness or sense of ego. It was a machine. But it was a machine so enormously versatile that only miraculous simplicity made its existence possible. How? A new pattern for electronic orbits? Or something quite unimaginable—

We can see into the microcosm with the electronic microscope, Melton thought. *But we can't see far enough. Beyond—*

There was an off-beat, distant rhythm in the quiet movement within the walls.

This is the house that Jack built.

This is the malt

That lay in the house that Jack built.

And so on. Melton followed the nursery rhyme to its conclusion. The inevitable growth, line by line, acquired a sort of horror to him. Yet he could not stop. He finished it and started all over.

Who had John French been?

Or what?

Suddenly and sickeningly, he felt the disorientation. Without looking at Michaela, he sprang from bed, fumbled his way downstairs, and stood motionless in the hall, waiting.

There was nothing.

This is the house that Jack built.

This is the rat—

He went out to the kitchen. The cellar door was open. He could not see Phil, but he knew that his brother-in-law was at the foot of the stairs.

"Phil," he said softly.

"Yes, Bob."

"Come on up."

Phil mounted the steps. His pajamaed figure came into view, swaying slightly.

"What's down there?" Melton asked.

"Nothing."

"Liquor?"

"No."

"Then what is it?"

"Nothing," Phil said, his eyes

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glazed and bright. "I stand in the corner, my head against the wall, and . . . I . . . paint—" He slowed down and stopped. "No," he said after a moment. "It isn't painting, is it? But I thought—"

"What?"

"The house suited Jack, didn't it?" Phil said. "But then we don't know what Jack was or what he wanted. I wonder if he came from the future? Or from another planet? One thing—he certainly came from a place that was rather remarkable."

"We're moving," Melton said. "As soon as I can find a place."

"All right."

"Let's go to bed."

"Sure," Phil said. "Why not. Good night, Bob."

"Good night, Phil."

For a long time he lay awake, unable to sleep.

This is the house that Jack built.

I wonder if Jack might come back—sometime?

The house suited Jack.

The house was alive.

No, it wasn't. It was a machine.

Any house could be such a machine—with a little renovation. By Jack.

The machine suited Jack. Sure. But what effect would it have on humans? Mutation? Translation, eventually, into another world? Something thoroughly unusual, at any rate.

Melton was not tempted to find out.

I'll find an apartment tomorrow, he resolved. And, a little comforted, he went to sleep.

He got home the next evening somewhat early, and let himself into the house without hesitation. Michaela and Phil were in the living room. They were sitting silently, but turned to watch him as he entered.

"I've got an apartment," Melton announced triumphantly. "We can start packing right away. How does that sound?"

"Swell," Michaela said. "Can we move tomorrow morning?"

"Sure. Jack can have his house back."

The lights came on. Melton gave them a quick glance.

"Still at it, eh? Well, who cares now? Drink? How about a cocktail, Mike? I'll even tackle the icebox tonight."

"No, thanks."

"Mm-m. Phil?"

"No. I don't want any."

"Well, I do" Melton said. He went into the kitchen, decided against ice cubes after all, and came back with a straight shot in a tiny glass. "Are we eating out tonight?" he demanded.

"Oh," Michaela said. "I forgot dinner again."

"I think we'd better move tomorrow," Melton said, "if not tonight." He sat down. "It's too early to eat now, but we can kill time with a drink or two." He looked at the clock. It was 4:20.

He looked again.

It was 10:40.

Nothing had changed. But the sky was black outside the window. Outside of that, nothing had altered; Michaela and Phil had not

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moved, and Melton's drink was untasted in his hand.

For a moment he thought wildly of amnesia. Then he realized that the truth was much simpler. He had simply let his mind go blank—he could even remember doing it—so that the time had, incredibly, slipped past until—

It was 10:40.

The shock of disorientation came, more slowly this time. It passed and was gone.

Neither Michaela nor Phil moved.

Melton looked at the clock. Simultaneously he felt a leaden, dull blankness creeping over his mind. *This is like hibernation,* he thought; gray, formless, without—

It was 8:12.

The sky was blue outside. The river was blue. Morning sunlight blazed on green patterns of leaves.

"Mike," Melton said.

"Yes, Bob."

It was 3:35.

But it was not time that had altered. Melton knew that very clearly. The fault lay in the house.

It was night.

It was 9:20.

The telephone rang. Melton reached out and lifted the receiver from its cradle.

"Hello," he said.

Dr. Farr's distant voice sounded loud in the still, hot room. Michaela and Phil sat like carved figures under the bright overhead light. Presently Melton said, "No. No, we changed our minds. We're not going to move—"

He hung up.

Hibernation, he thought. The process had cumulative acceleration. For this was the house that Jack built. This was the den that Jack built. Some races—not human races—may need periods of hibernation. And they will build robot machines—very simple machines—to care for them while they sleep.

Adaptable machines. Machines that can adapt to other organisms. Human organisms. With a difference.

Hibernation for Jack—yes. But for Melton and Michaela and Phil—It wouldn't work out in quite the same manner. For they were not of Jack's breed or race.

"We're never going to move," Melton said softly, and saw that it was 1:03.

Within the walls the machine stirred, recharging itself. Moonlight came through the windows, distorted by some quality in the clear panes. The three figures sat motionless, not even waiting now, in the house that Jack built.

THE END.

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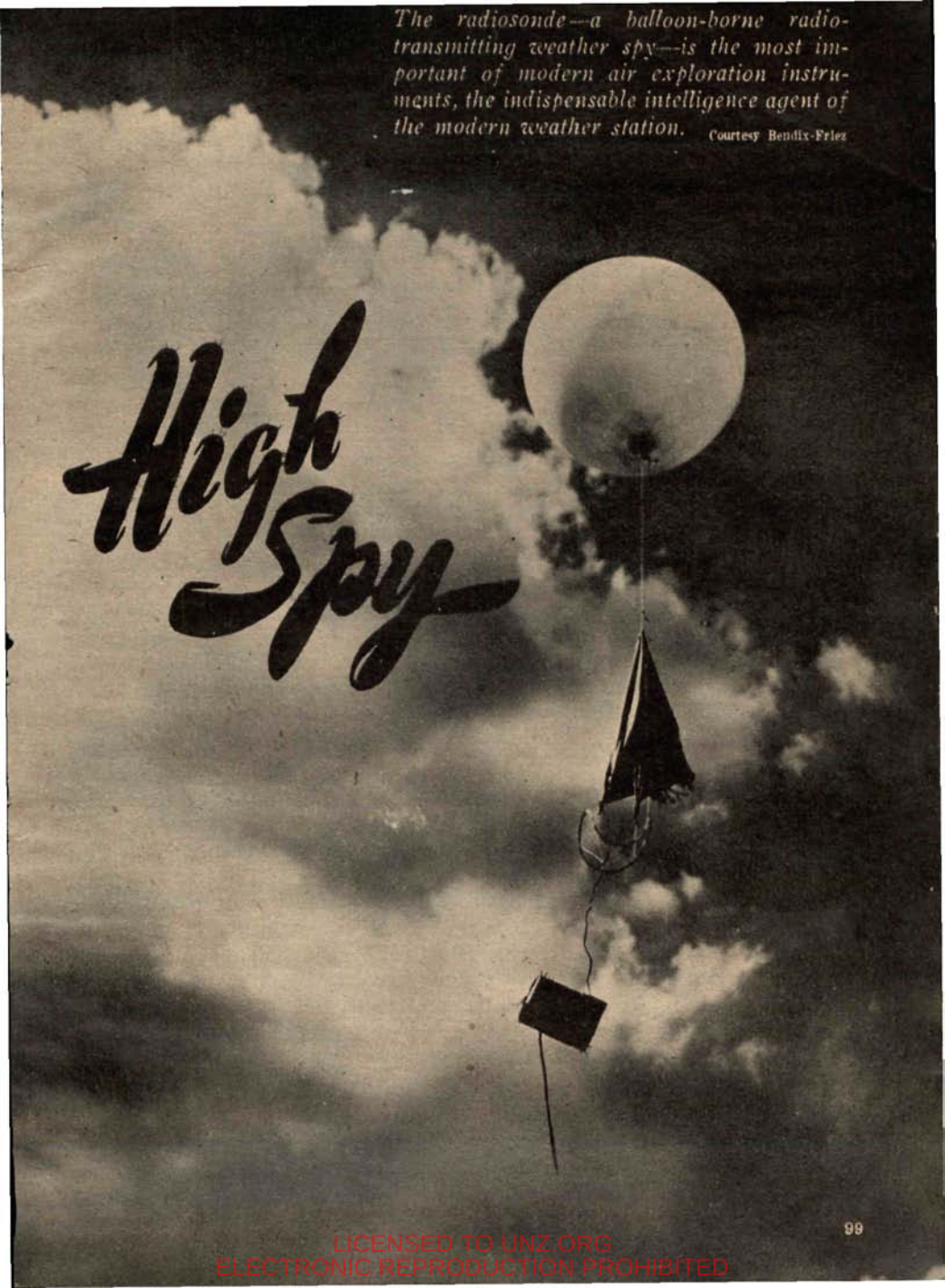

The radiosonde—a balloon-borne radio-transmitting weather spy—is the most important of modern air exploration instruments, the indispensable intelligence agent of the modern weather station. Courtesy Bendix-Friez

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Unpredictable

by JACK WILLIAMSON

Never before in history has weather been so important to nations. Air fleets can be trapped helplessly in the air by bad visibility, sea fleets destroyed by storms, tens of thousands of men killed because necessary support cannot reach them. But still weather remains one of the greatest of the Unpredictables.

A B-29 is waiting on an eastern airfield, ready for the long hop across the continent, and ultimately to Tokyo. In the Army weather station, the pilot greets the forecaster:

"How is it to the west coast?"

"You'll see some weather, sir." Speaking against the unending clatter of the teletype machines behind him, the forecaster gestures toward the array of maps and charts that show the day's weather.

"From here to the Mississippi you have warm air from the Gulf, causing only scattered cumulus. But there's a cold polar air mass moving down over the plains states beyond, with snow and low stratus ceilings."

"What's the top?"

"You will be above the clouds at eight thousand feet, mean sea level. But over the Rockies you will hit an occlusion that is just now moving in from the Pacific. You will have to climb to twenty thousand, to avoid icing and severe turbulence in the frontal clouds."

"O.K., and what have we got on the coast?"

"Your destination is socked in, now, with low stratus and rain. But the front is moving inland, and it will clear by noon, Pacific time. You will have scattered cumulus at three thousand, and unrestricted visibility."

"Good enough. We're taking off in thirty minutes."

"Roger., I'll write it up."

While the forecaster is making

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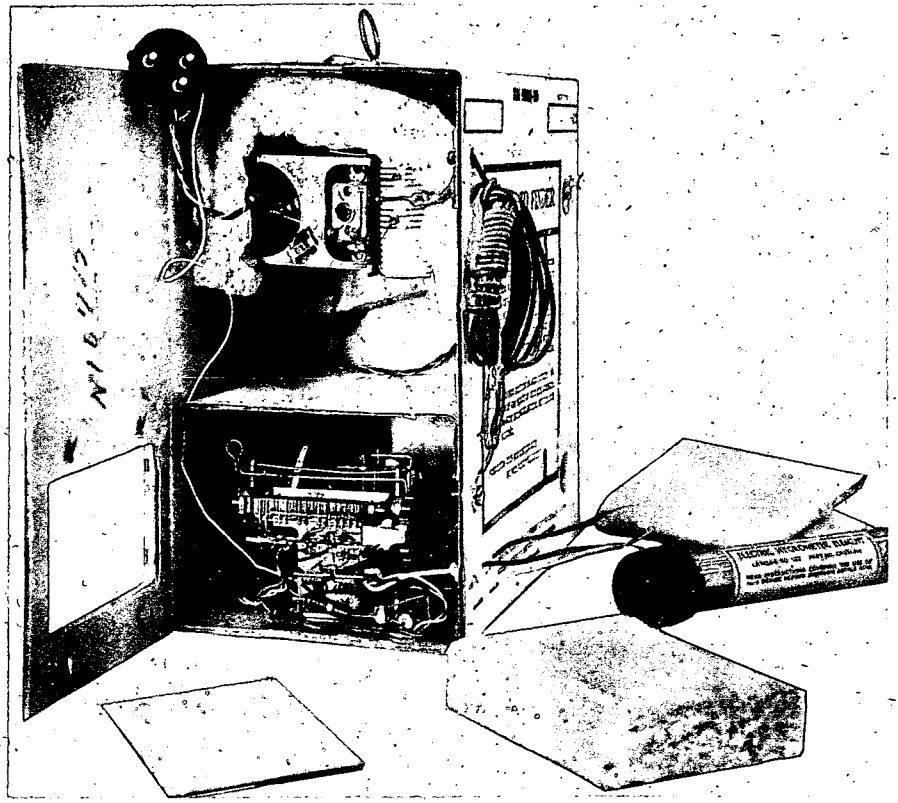

The interior workings of a Friez Instrument Co. radiosonde. Absolute economy of weight plus reliability are the prime requirements. A tiny battery-powered transmitter sends back reports of air pressure, temperature and humidity, while the drift gives readings on wind speed and direction.

Courtesy Bendix-Friez

up a detailed route forecast for the pilot's clearance, let's look at the science of meteorology and examine the extremely peculiar art of weather-forecasting.

This article is not guaranteed to make a successful forecaster out of every reader. Only an arthritic knee or several years devoted to the dynamics of the atmosphere can do that. But it will enable you to visit your local weather station and startle the forecaster on duty by understanding some of his technical double-talk.

In spite of the old but challengeable saying that what people don't know doesn't hurt them, the human race has displayed an eternal desire to know the future. Such an insatiable demand for knowledge has always created a supply—of sorts.

That old human fact has had two effects on the march of science. Of

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course it is a powerful stimulus to research, but the other effect is less fortunate. Astronomy can trace its origins to the hopeful star-gazing of the astrologers, but the science took some forty centuries to shake off the bad reputation it got from the failures of too-ambitious seers.

If meterology has been a neglected stepchild among the sciences, it must be partly because of the inexorable demand for weather knowledge, so vitally important to most activities of war and peace, which has forced the young science to assume responsibility for too many bad forecasts.

Farmers, herdsmen, and sailors have been gathering weather lore ever since the first nomad noticed that a red sunset meant fair weather and a red sunrise foretold a storm —true because weather disturbances in the middle latitudes usually move toward the east with the planetary drift. Aristotle christened the science, with his *Meteorologica*. Thereafter it was stagnant for two thousand years, until Galileo invented the thermometer and Torricelli the barometer.

Columbus had discovered the trade winds. Halley, in the eighteenth century, tried to explain them —but the behavior of the atmosphere proved a little more baffling than that of the comet whose return he forecast. He failed to consider the effect of Earth's rotation, which was recognized by George Hadley in 1735.

The German, Brandes, produced the first series of daily weather maps in 1820—but for the year 1783; maps for forecasting use had to wait for rapid communication. Brandes also explained storms as barometric depressions moving from west to east.

An American, James Pollard Espy, published his "Philosophy of Storms," in 1841. After the invention of the telegraph, he and Joseph Henry organized the first weather service in the United States. An official service began under the Army Signal Corps in 1870, and this became the Weather Bureau in 1891.

The twentieth century found meterology in the doldrums, but World War I led to a rebirth of the science. V. Bjerknes and a few other Norwegian meterologists, limited to the weather data from their own small area, came up with the new theories of air mass and frontal analysis—the "fronts" between different air masses surging against each other were named from an apt military parallel.

The demands of the recent war called forth a tremendous new effort. Thousands of meterologists have been trained. A new network of weather stations covers the world. Important research projects are under way. The lifting of military restrictions will no doubt reveal great new advances.

The requirements of a satisfactory forecast depend, of course, on the needs of the user. The primitive hunter and herdsman were able to do well enough, just with a look at the sky. If the rains failed in one vicinity, they merely moved on to another.

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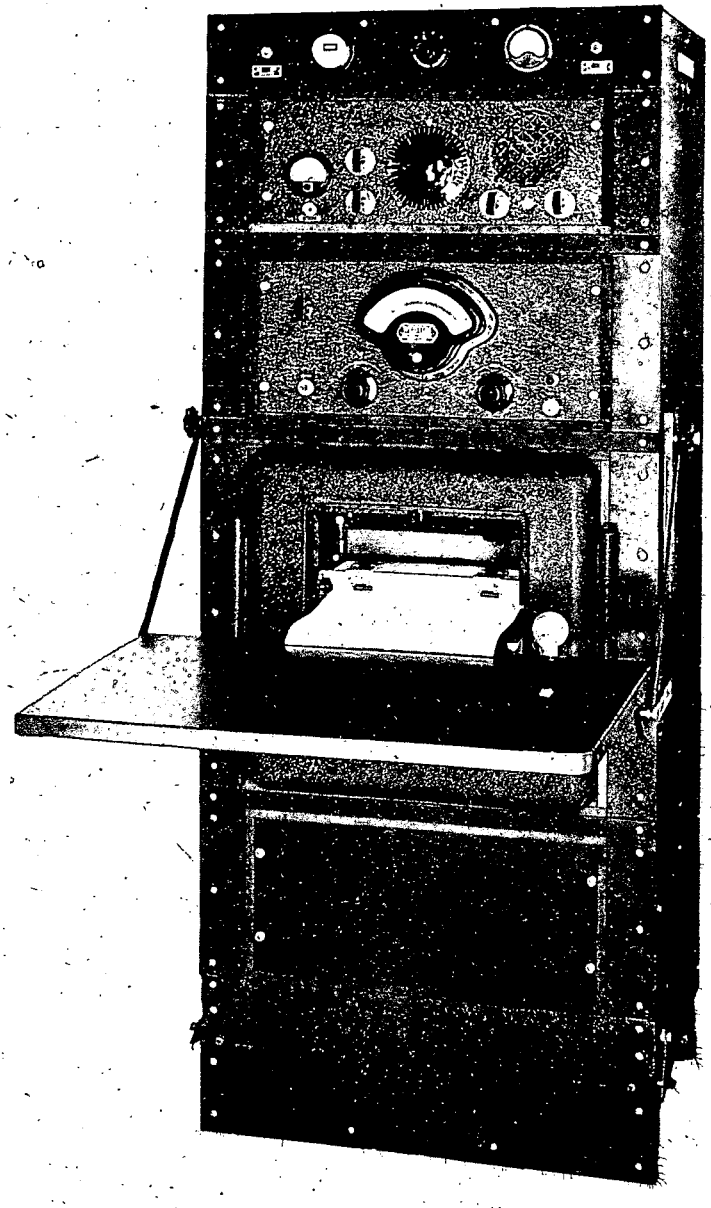

Ground instruments, designed to match the characteristics of the radiosonde, record the radioed data.

Courtesy Bendix-Friez

When men settled down to farming, forecasting requirements became a good deal more exact. They needed to know when to plant, and so evolved the calendar. They also needed to know whether the coming season would be wet or rainless, hot or unduly cold—as witness the yearly almanacs put out by patent medicine firms. And they still need to know, for the scientific weather calendar has yet to be published.

In the modern world, forecasting requirements are becoming highly specialized—the postwar world, with thousands of meteorologists looking for jobs, should see a quick expansion of special weather services, for enterprises as varied as painting bridges and shooting movies on location. Because a forecast which is perfectly satisfactory to the farmer may be quite inadequate to the minister who is aware of the effect of a sultry maritime tropical air mass on the response to his sermon.

The airplane pilot, for another example, wants to know the height of the clouds, and the fraction of the sky which is covered. If there are several layers of cloud, he wants to know the height and thickness of each layer. He wants to know the direction and velocity of the winds aloft, at all flight levels. He wants to know the visibility in miles. He wants to know if there are such hazards as icing, turbulence, lightning and precipitation static.

And the pilot wants all those facts, not for a single point or a single moment, but for a route that he may follow for a dozen hours, across a few thousand miles of land or sea. If he is flying over enemy territory, he will want to know where there is danger of leaving condensation trails. If he is planning to drop bombs, he will need certain additional information, such as the pressure and the mean temperature of the air over his target.

The modern airways forecaster can supply all that information with a fair degree of accuracy for perhaps twenty-four hours, and for longer periods with less accuracy. But suppose we could forecast the bombing conditions over any target, day by day, for a year! We'll consider the ultimate chance of such developments, in the second part of this article.

Speaking of forecasting accuracy, it means nothing to say that your Old Wizard Weather Forecaster is ninety-nine percent accurate—unless you specify which elements are to be forecast, and within what tolerance of error. This problem of testing and grading forecasters has been explored by the Weather Service. It has been found that forecasts rating about sixty-five percent by the methods used can be made by such mechanical means as forecasting climatic averages, forecasting the present weather to persist, or even by pure random selection. That leaves a margin of about thirty-five percent for the exercise of real forecasting skill.

Such skill, unfortunately, is still hard to account for on strict scientific terms. For weather forecasting is still an art—similar, in

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certain ways, to the ancient arts of the sibyl and the oracle. The discovery of that fact is painful to the science-minded newcomer in the field. He has to learn to make immediate decisions on the basis of inadequate and often inaccurate data, to state those decisions with confidence—and be generally right.

In contrast to the quasi-scientific art of forecasting, a simple sort of descriptive meterology has achieved fairly reputable standing, as a subdivision of physics or a minor branch of geology. Such men as Pettersen and Rossby have been making vigorous efforts to apply the methods of mathematics to forecasting problems, but with less than complete success.

The weather, like the days and the years, is the result of astronomical events. The chief elements which affect human activity and comfort are wind, temperature, and moisture. The long claim of events which causes any particular combination of them, at any one place and time, is almost infinitely complex. The mathematical meteorologist is forever obliged to simplify his calculations by making assumptions that do not hold in the actual atmosphere—or by dropping terms that, unfortunately, are smaller in magnitude than the limits of observational error. No lapse rate is exactly uniform, no air mass is ever quite homogeneous, no cyclone ever moves or even accelerates at quite an even rate, no weather map ever quite duplicates another.

Yet, for all the difficulties of either the practical forecaster or the research meteorologist—the two groups are quite different in viewpoint and method—the physical principles involved in the weather are few and simple enough.

The sun is the heat-source of the atmospheric engine. But the heating, remarkably enough, takes place at the bottom of the atmosphere. That is because dry air is almost completely transparent to visible light, which carries most of the sun's energy. Largely absorbed by the ground, this energy is partly conduced to the lowest layers of air, and partly radiated back—but now as longer infrared waves, which are absorbed by the water vapor and carbon dioxide in the lower atmosphere.

If the air were heated from the top, instead, the effect would be an astounding story. The lower layers would remain cold and stagnant. There would be no surface winds, no clouds; only calm, clear, eternal winter.

Surface heating makes the atmosphere unstable. Because heated air expands. It becomes relatively lighter. It usually also picks up water vapor, only five eighths as dense as dry air. It rises, in thermal convection. That process is the mainspring of the weather.

Rising air gradually escapes from the weight of the air column above it. It expands, against decreasing pressure. Heat is converted into mechanical energy. If the change is adiabatic—that is, without any other gain or loss of heat—the temperature will decrease from the sur-

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A Marine weather observer on Okinawa prepares to send up a sounding balloon. Following the rise and drift of the balloon by telescope is the older, and necessarily more common, method of testing weather conditions.

Wide World Photos

face aloft at about 10° C. per kilometer. That rate of temperature-change with height is known as the dry adiabatic lapse rate. It is the rate actually found in well-mixed masses of dry air, such as continental tropical air over New Mexico in the summer.

If the rising air is cooled to its dew point, however, it becomes saturated. If cooling still goes on, part of the invisible water vapor must be condensed—into clouds, fog, or dew. And condensation releases its latent heat, so that the rising column of saturated air now cools more slowly—at the "wet" adiabatic rate, which averages about 6° C. per kilometer.

Adiabatic charts have become important tools of the forecaster. They are cross sections of the atmosphere, showing the distribution of temperature and moisture from the surface upward. Data for them is obtained by the radiosonde.

The radiosonde is an ingenious little gadget, weighing less than three pounds, which is carried to heights of twelve miles or so by a small balloon. It sends back by radio a continuous record of the pressure, temperature, and relative humidity of the air through which it rises.

These charts enable the meteorologist to identify an air mass at a glance. An "air mass" is a large body of the atmosphere, usually some thousands of miles across, which has acquired uniform modifications of temperature, moisture, and stability. With the aid of soundings, the forecaster is able to follow these vast, ever-changing units of air across the maps from day to day, each bringing its characteristic weather.

Elaborate systems of designating air masses have been set up. Here, it is enough to comment that fresh continental polar air is dry, stable, and cold—with a mixing ratio of less than one gram of water vapor per kilogram; while a maritime tropical air mass, moving inland from the Gulf, may carry 20 grams of moisture per kilogram.

The most violent weather is usually along a "front"—a boundary surface between two air masses of different density. When warm air is actively lifted over a more dense cold air mass, it is cooled by expansion, with its water vapor condensing into storm clouds. A passing front usually brings lowering ceilings, a shift in wind direction, a change in temperature, and often rain or snow. A vigorous cold front can bring a dramatic change in weather, from the suffocating breath of the tropics to the dry stimulating wind from the northlands.

The adiabatic charts will often show a frontal surface aloft—for the colder air will sometimes extend, wedgelike for hundreds of miles underneath the warmer air mass. In addition, the charted soundings show the freezing level, the likelihood of turbulence or icing, and the bases and tops of clouds. Perhaps most important, they show instability.

Instability means simply the tendency of the air to turn over. A

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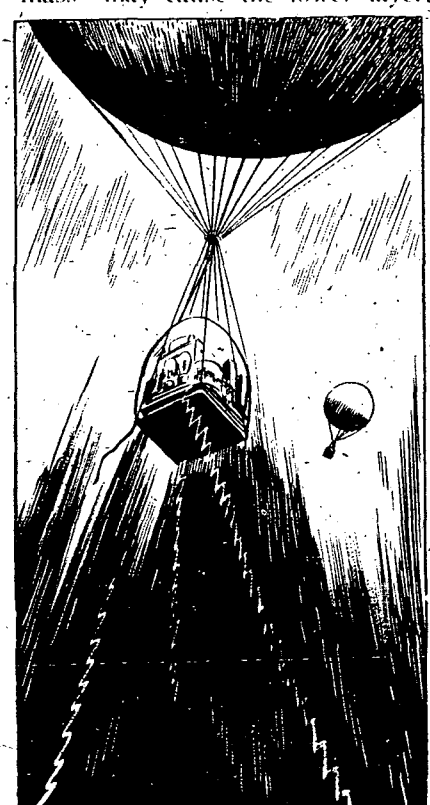
continental polar air mass, cooled from the surface by the outflow of radiated heat from the arctic snows, is dense in the lower layers and so extremely stable. But tropical air masses, with heat and moisture added to the lower few kilometers from passage over hot lands and warm seas, are unstable—top-heavy.

Instability occurs in several sorts and degrees. Conditionally unstable air, for example, is stable so long as it is unsaturated. But lifting—as it flows over a mountain, or up a frontal surface over another air mass—may cause the lower layers



to become saturated before those above. Unequal rates of cooling then makes the upper layers more dense. And equilibrium will generally be violently restored—with a thunderstorm.

Stripped down to fundamentals, the problem of the forecaster is to determine and predict the flow of air. Knowing the previous path of an air mass, he knows at once what modifications of temperature and moisture it must have picked up. If he can tell the future path, he knows what weather it will bring.

The most important lines on all the charts, from the surface synoptic map up to the sixteen kilometer level or higher, are the isobars. Other iso-lines are also used, to show pressure-change, perhaps, or temperature and moisture.

Isobars are lines of equal pressure, but they are important because they show the flow of air. For the wind doesn't blow across them; from high pressure to low—that is one of the fascinating facts of meteorology. Air flows along the isobars, so that low pressure, in the northern hemisphere, is always to the left of a man facing downwind.

That is a consequence of Earth's rotation. For the equator, relative to the poles, has an eastward velocity of about one thousand miles an hour. When a stream of air moves northward, it retains that momentum, while advancing over a surface that is moving more slowly. Momentum urges it toward the east.

That tendency to turn acts on

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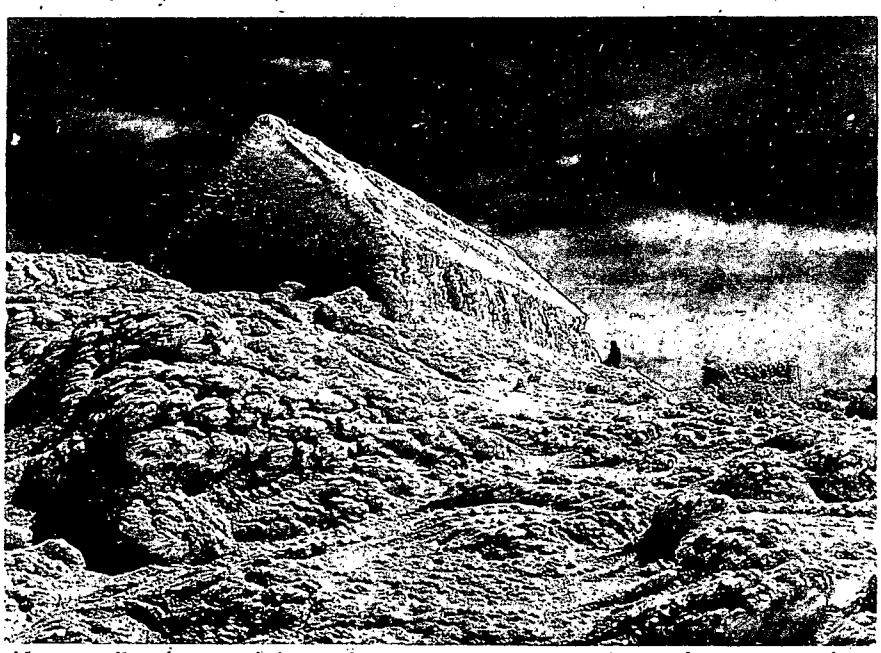
every moving body on Earth's surface—it even causes an unequal wear on the flanges of railway wheels. It affects only direction, never velocity. Its direction, in the northern hemisphere, is always to the right. It is called the Coriolis deflection.

Each moving particle of air is subject to a balance of forces—the pressure gradient, centrifugal force, and the Coriolis deflection—which are defined in the geostrophic and gradient wind equations.

The isobars, however, are not quite true streamlines. Near the equator, the Coriolis effect is negligible, and the so-called Eulerian winds blow from high pressure to low. At any latitude, winds near the surface are slowed up by friction, reducing the Coriolis effect and so upsetting the balance of forces, so that air "leaks" outward from a high pressure center, and toward the center of a LOW. Friction between layers moving at different velocities can cause the same effect aloft.

Because of such effects, pressure systems are transient things, always in dynamic change. A HIGH is caused by cold heavy air, either near the surface or aloft. But the "leakage" across the isobars near the surface means that the upper layers are steadily subsiding, to replace the lost air, and subsiding air is warmed by compression.

The radiation of the arctic snow-



Necessarily, the weatherman has to be exposed to the weather—even when, as here on Mount Washington, it's nearly all bad, windy, frosty and cold.

Wide World Photos

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lands, pouring heat into space, can overcome the effect of that heating. As the air mass is cooled, pressures build up and up, sometimes to 1050 millibars. Then at last the new polar air mass breaks out of its source region, to push the polar front down across temperate lands in a kind of blitzkrieg of the winter gods.

In a LOW—whether it is an occluding wave along the same polar front, or a tropical hurricane—there is the same "leakage" across the isobars. This movement toward the center of a LOW is termed convergence, as opposed to the divergence in a HIGH.

Convergence makes the storm a kind of mighty engine. Flowing toward the center, the air has to rise. If moisture-laden, it cools only at the "wet" adiabatic rate, so that the rising column stays warmer and lighter than the surrounding air, and the LOW is not filled up. Water vapor becomes the fuel of the storm, driving the winds with the energy from latent heat. The output of the Okinawa typhoon was calculated to be 12×10^{11} horsepower.

Such LOWs—ranging from the tornado with its destructive twisting funnel sometimes only a few yards across, to the great cyclonic storms of our middle latitudes whose clouds may blanket a million square miles—are easily the most spectacular weather phenomena. Naturally, they dominated the attention of the pioneer meteorologists. The modern air mass theories, however, have brought a shift of emphasis from LOW to HIGH.

While the LOW is nothing more than a dynamic effect of unstable equilibrium being restored, the isobars around a HIGH represent something more material. Usually they outline a unique body of air, whose characteristics determine in advance the history of any neighboring LOWs.

The "air mass weather" in a HIGH may be good or bad—the barometer alone has been greatly overrated as a forecasting instrument. Subsidence, bringing dry air down from aloft, tends to dissipate any upper clouds, often causing fine clear weather in a HIGH. But fog and low stratus are likely to form in the cold turbulent air beneath a subsidence inversion. Or instability, due to modification from a warm, moist surface, may cause air mass thunderstorms.

The movements of LOWs and HIGHs, of course, are all part of the general circulation of the atmosphere. The winds of the planet are driven by thermal convection. Warm, moist air rises from the equatorial regions. Air cooled from the arctic wastelands flows back in the lower levels, to take its place. But that simple picture is complicated by such factors as the Coriolis deflection. Instead of one circulation cell, in each hemisphere, there are three.

Nearest the equator are the tropical cells. Pressures are low along the equatorial zone, where light moist air is rising. Spreading toward the poles, aloft, the winds from the equator are deflected to

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become west winds, in the thirties of latitude. And they are somewhat cooled and dried.

There is slow subsidence in the huge semipermanent high pressure centers that lie over the cooler oceans at about thirty degrees from the equator, and dominate the adjoining lands. Little convection or condensation is possible in this descending air, and here under the poleward sides of the tropical circulation cells lie Earth's great deserts.

But part of those upper southwesterly winds—or northwesterly, in the southern hemisphere—flow on toward the pole. There, intense surface cooling forms the polar HIGH. Each polar cell is a separate heat engine. It runs on the energy of condensation, released in the rainy upper latitudes. The waste energy is lost from the surface—snow is an excellent "black body" radiator for the infrared.

Between those two independent circulation cells, is a third. Not itself a good heat-engine, this middle-latitude cell is driven largely by friction with the others. It extends from the great HIGHs of the thirties to the persistent LOWs of the sixties. Its prevailing winds are from the west at all levels—the low-level winds to the north in our hemisphere are the polar easterlies, and to the south the easterly trades.

The forecaster in the temperate zone is immersed in that middle cell—we may call it a planetary drift. It is an Earth-circling river of air, some thirty degrees of latitude wide, and twenty-five kilometers deep, flowing out of the west.

But it isn't a uniform stream. The west winds aloft spiral toward the north, and chilled air accumulates in the polar HIGHs—for there is no steady return flow. The polar front, where the icy easterlies meet that deep west wind, acts as a barrier. Pressures in the polar HIGH continue to rise, as we have seen, until the sudden violent outbreak disrupts the whole circulation pattern.

The result is that this broad aerial river of the middle latitudes swings north and south, like any river. Masses of arctic air burst into it from the poleward side, and compensating flows of tropic air move in from the other. The upper-level isobars usually show a wavelike pattern of flow, with a succession of troughs and ridges.

The cold air masses slide underneath this mighty stream, in moving cold domes two or three kilometers deep. But the tropic air, surging up ahead of the LOW that forms to the east of each polar outbreak, moves poleward in a current some fifteen kilometers deep. It brings with it the cold high tropopause of the tropics, while the tropopause over the polar domes is low and relatively warm.

Most of the world's weather takes place in the troposphere—the turbulent lowest layer of the atmosphere, which is kept mixed by convection. The tropopause is merely the boundary between this layer and the more stable stratosphere, above.

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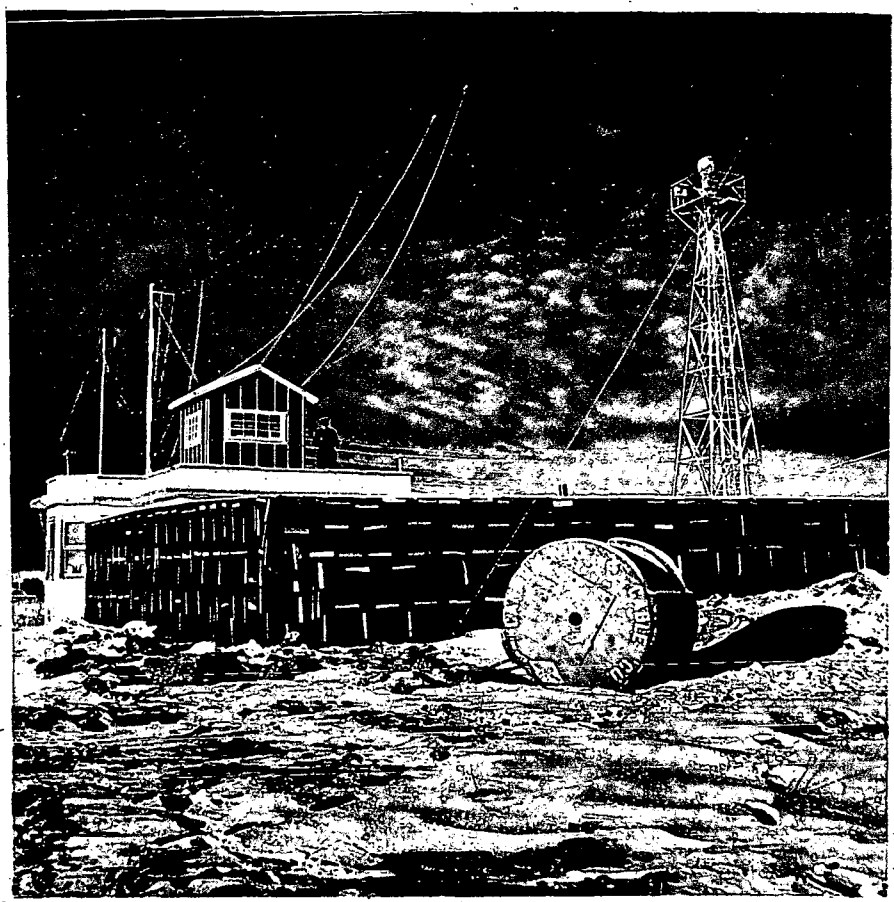

The Allies maintained a network of radio stations—Marines on Okinawa, Navy ships at sea, Russian reports from Siberia, Chinese reports from the Asiatic mainland. The R.A.F. maintained this one in Canada. And everywhere, locations were selected for value, not for convenience of personnel.

Wide World Photos

The troposphere has the normal temperature lapse rate of mixed moist air—the sounding balloon shows temperatures about 6°C. lower, on the average, for every kilometer of ascent. It is deepest over the equator, because surface heating and convection are there the strongest. Temperatures fall with increasing height, to around -75° C., at about 17 kilometers.

The troposphere over the poles is relatively shallow, because of the lack of any convection—some eight kilometers deep in winter. Hence, in spite of the colder surface, the

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arctic tropopause is warmer than that over the tropics, with temperatures around -50° C.

The lower stratosphere is fairly well known. Special sounding balloons have reached heights above twenty miles. Members of the stratosphere expedition sponsored by the Army Air Forces and the National Geographic Society made an enduring record, for human beings, of almost fourteen miles.

Most of the atmosphere has been explored. Ninety percent of its weight is below ten miles, and ninety-nine percent below twenty miles. The thin atmosphere above that level, however, has an importance on the radiation economy of Earth far out of proportion to its mass, and may well have a corresponding influence on the weather.

The lower stratosphere is almost isothermal—there is little change of temperature with height. Above the weather, this cloudless domain seems the perfect highway for pressurized airplanes.

Higher, at about fifteen to twenty miles, there is a much warmer layer, heated by the ultraviolet radiation of the sun, which is absorbed by the relatively high concentration of ozone there. Temperatures there reach about the same values as at the surface.

Higher yet, above sixty miles, there is another layer where radiation is absorbed by oxygen atoms excited to the monatomic state. The temperatures here probably reach several hundred degrees C. by day, and fall far below zero at night.

These mysterious upper reaches of the atmosphere are known chiefly by indirect means—from the reflection of sound by the warm ozone layer, from study of the dusty noctilucent clouds and meteor paths and the green light from excited oxygen atoms in the night sky.

Intimate connections must exist between the circulations of stratosphere and troposphere. It seems logical that changes aloft should precede and control those in the more sluggish surface layers. But the subject as yet has been only touched. We shall look at the rocketsonde, and other future possibilities, in the second installment of this article.

Now let's take a glance at the tools and thoughts of a present-day meteorologist at work—at our Army forecaster, on that eastern airfield, writing a route forecast for the B-29 pilot going to the west coast.

Coming on duty, the forecaster made a quick informal weather observation. The warm wind was southerly. The sky was clear, but the hazy color of it told him that this was tropical air, laden with moisture, likely to form afternoon cumulus.

In the station, he looked first at the records for the past twenty-four hours, showing hour by hour every change in wind, temperature, cloudiness, and pressure. A glance at the synoptic maps, spaced six hours apart, showed him the rapid push of the polar high down across the plains states from Canada, and the occluded front moving in from the Pacific. Another look at the upper-

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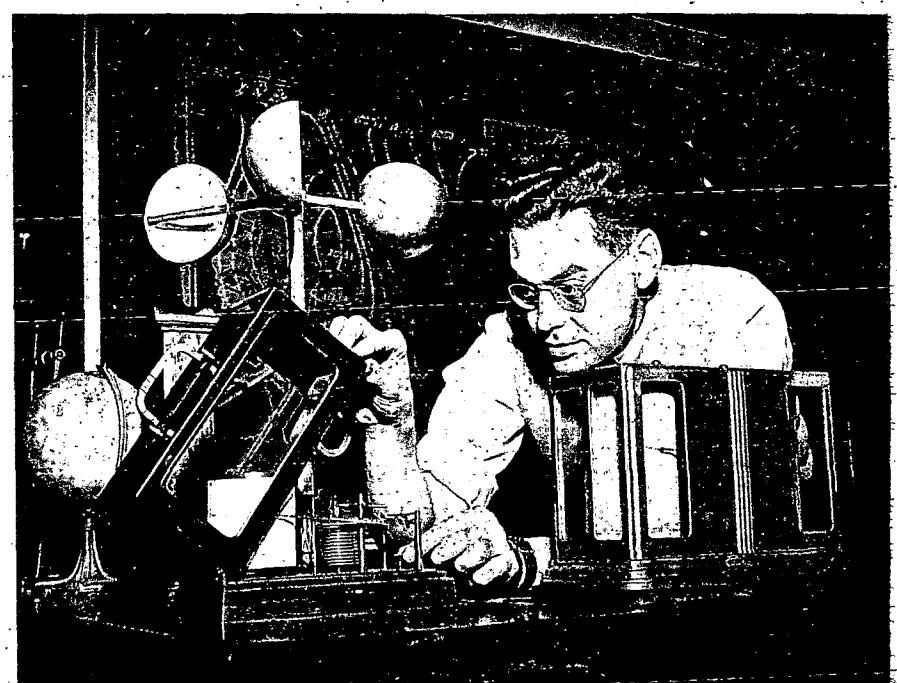
level charts showed him the general pattern of flow, with the probable movement and development of the cold front and the occluded one, with the differing air masses behind them.

His trained mind was shaping a picture of the weather—as a changing, dynamic situation. A glance at the sequence tables showed him the existing conditions along the airways, reported every hour. Those hourly reports enabled him to keep his mental weather map up to date, to follow the fast march of the cold front down from the north, station by station.

The observer placed the new synoptic map on his desk. The freshly plotted data showed the weather for hundreds of stations, all over the continent. This was the great hour of his working day. All his skill and training went into the task of analyzing the map—and, as he smoothed a front into a careful and beautiful curve, he was as much artist as scientist. He was responding to a total situation, with half his mental processes unconscious. He could hardly explain, to the strict scientist, why he threw out



Thousands of men had to be trained to man the new stations established across the whole Earth, and the schools to train them came first. Two recording barographs, anemometer cups and the weather map, are visible; add thermometer and hygrometer, and you have the basics of the work.

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the data from half a dozen stations as unreliable, and yet drew isobars for a new occlusion, entering the western edge of the map, from the evidence of a single reported wind and pressure.

By the time the pilot came in, he knew the weather situation intimately, almost as one knows a person. He was aware of the characteristics of all the air masses involved, he knew, almost without thinking, the way they would behave during the next twenty-four hours. He needed the map only to show the pilot what he would encounter.

Writing the forecast, however, he had to reduce that living picture to numerical terms—always trying to anticipate the infinite complexity of change, that could so easily make figures lie.

The cold front, he calculated, was moving thirty miles an hour. Fighting a headwind of forty miles an hour, the bomber would cross the front at Wichita. But the overrunning air would still be stable and dry. There would be no frontal thunderstorms, and the bomber could climb safely over the deck of low stratus clouds in the cold air, with their tops below eight thousand feet.

The air mass over the eastern Rockies was unstable, but fairly dry. There would be a few afternoon thunderstorms over the mountains. But the convective condensation level was sixteen thousand feet, MSL—which would allow safe flying space between cloud bases and mountain tops.

Then there was the occlusion on the coast. The pilot's destination was reporting zero-zero, in rain and fog. The pressure was low, with a warm south wind. But stations higher up the coast were already clearing, with pressures rapidly rising and colder west winds.

That meant that the occlusion, which he had placed on the previous day's maps from deductions almost as complicated as those of a fiction detective, was moving inshore. It would pass the destination, causing clearing conditions, at least three hours before the bomber arrived.

The pilot, of course, would still have to climb to twenty thousand feet, over the mountains inland, to get above the frontal weather. But such an altitude is no problem for these giant planes, that already reflect the airlines of tomorrow's civilian airways.

A few minutes of concentrated mental effort, and the forecast is ready, complete with winds aloft and expected altimeter setting at the destination. The pilot and the navigator listen to an oral briefing, and take off. The forecaster stays behind, to sweat it out.

Sometimes he really sweats. The conditions he forecasts are an excellent probability, but never quite a certainty. In the second part of this article, we shall look at the probable future of the science of meteorology, and try to forecast whether or not the curious unscience of weather predicting will ever become really scientific.

TO BE CONCLUDED.

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IN TIMES TO COME

Next month George O. Smith starts a new serial. "Pattern for Conquest," with a slightly different angle on the proposition of the galactic conqueror. The basic problem is not exactly new—Earth menaced by the approaching wave of all-conquering Conquistadors who are mopping up the Galaxy in building their empire. But the development of the theme has several new notes—some of them evolving out of some of Smith's wartime work, I suspect. He had a part in developing radio and radar gear that would not furnish a square meal for protoplasmic blobs known as fungus. Some of the forms of fungus they encountered in the South Pacific really were remarkable—the darned things would live on obviously indigestible delicacies such as bakelite composition panels. They'd eat tanned leather overnight, destroy "rot-proof" cloth. But interestingly, made very little headway in attacking man's untanned leather—his own skin.

That yarn starts next month. In months still further ahead—indefinite dates as yet, of course—a variety of old names will be showing up again. Bob Heinlein's back in California, and ready to start writing and loafing. L. Ron Hubbard, until recently a tourist on the Navy's South Pacific route—the hard way, via Java, Australia, Alaska, Hawaii, Saipan, et cetera—is also back in California. There will be other old names returning, and, inevitably, brand new names showing up.

Isaac Asimov, research chemist in a Navy lab during the war, has been drafted for the postwar army; how much writing he can do now, I don't know.

Eric Frank Russell was in the RAF during the war; he should be writing more soon.

THE EDITOR.

ANALYTICAL LABORATORY

Reports on the October issue were pretty well scattered on votes, and the fact that there were—because of the length of "World Of Ā"—only four stories is largely responsible for the relatively low-point scores. Usually a considerable disagreememnt as to order of merit results in high-point scores with small differences. It's that type of lab this time, but the point scores are low.

Place	Story	Author	Points
1.	World of Ā	A. E. van Vogt	1.50
2.	Giant Killer	A. Bertram Chandler	2.25
3.	Interference	Murray Leinster	3.05
4.	What You Need	Lewis Padgett	3.30

The December Lab has one particularly interesting point. The scores go:

Place	Story	Author	Points
1.	The Mule (Pt. 1.)	Isaac Asimov	1.2
2.	By Yon Bonnie Banks	Geoff St. Reynard	3.0
3.	Identity	George O. Smith	3.3
4.	Tie:		
	Line To Tomorrow	Lewis Padgett	3.7
	The Critters	Frank B. Long	3.7

The point of interest? The fairly high point scores, closely grouped after the first place story, show scattering opinion. But the No. 2 story was the straight fantasy!

THE EDITOR.

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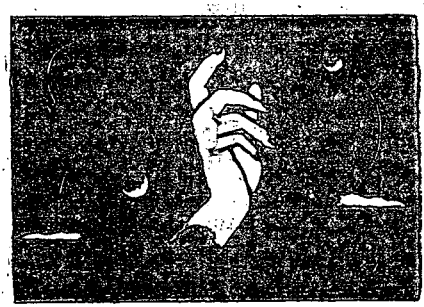

Brass Tacks

The Japs, most fanatical, suicidal people, realized the hopelessness of attempting to fight the atomic bomb.

Dear Mr. Campbell:
August Astounding:

1. "World of A," by Van Vogt. Very interesting story. So far much better than "Slan," which isn't saying much as far as I am concerned. His rather queer logic will jump out at you from the most unexpected places. Most of the time you don't know what the score is but perhaps the confusion will be cleared up later on. We shall see.

2. "Into Thy Hands," by del Rey. Don't know quite what to think of this story. I rather wonder if a scientifically trained robot would be as gullible as humans to what it is told when that information conflicts with other known facts, particularly. Oh, well. I seemed to detect a note of satire. Imagination?

3. "Paradoxical Escape," Asimov. Clever; a little short.

4. "Pipeline to Pluto," Leinster.

5. "Gift Horse," Rocklynne. Somewhat tedious, didn't seem to get you anywhere in particular. Can't turn out a hit every time, though.

Campbell and Richardson good, as usual. Your remarks on "the weapon that can't be stopped" seem unusually well emphasized by the events of a day or so ago. A thing so powerful as an atomic bomb does not even have to go off to produce the desired effect; even a dud would cause everybody within a radius of miles to evacuate for fear it *might* go off later. And when you see a lone plane a mile or so away drop a bomb and realize there

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is *nothing* you can do, you may in your last moments come to realize the futility of warfare. We hope so. Perhaps the atomic-powered world will have no need of it.

The art work is, even more so than usual, forlorn. I have seldom seen a worse cover than that disgracing this issue. It not only means nothing, it is poorly done, poorly chosen, and poorly composed. In short it is nothing to be desired. Now I am not one who favors weird-looking e.t.'s all over the cover, but I do like them to make sense. This one just looks dumb. I am not saying *I* could do any better, but I know Timmins can. I suppose you experienced the same dislike yourself, being an old stf. fan, but let it get by. Well, tastes differ, but if *anybody* liked that cover, I'd be surprised. I guess Van Vogt was surprised. Let's demand the best from Timmins, because he can really turn out better covers than this. You hear me, Timmins?

And, of course, Kramer disfigures the inside pages. He has about reached his nadir, but may be able to go even lower. I don't know. Orban is not very good, but better. Williams is the only ray of hope that I can see for a long time to come. Even he flops sometimes, as on page 83. But in general he has good ideas and good form.

Am waiting interestedly for more of "World of Ā." The man *does* write a gripping kind of story!—D. C. King, Cragmoor Village, Colorado Springs, Colorado.

Mutation may involve a great increase in a pre-existent characteristic, though.

Dear Sir:

It gives me some pleasure to write to you and express my opinions, because I have been reading this magazine for some time. It might give you an idea of my interest when I inform you that I learned to read at the mildly amazing age of five from "A'sounding S'ories", as I called them. Literally speaking, I cut my teeth on them. Both some of the words and the ideas were over my head, but I was fascinated by these modern fairy tales which came out every month. I don't hesitate to say that the magazine's quality is not half of what it was then.

But that is not the point. The above serves merely as an introduction. The real reason I am writing is to discuss the "Baldy" stories.

This series has interested me greatly. Besides their natural appeal as literary material, being well-written and showing a fine background, the idea they propound is entirely within the realm of possibility—indeed, being an extension of several theories and facts already possessed by our leading psychologists. It is not difficult to see where the author got his material.

However, I would like to take up the question of calling them "mutants." Mutation, according to leading authorities, is the process whereby an individual or a species shows significant changes in form or *character* in a single generation

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by leaps and bounds. These Baldies were telepaths. Their children were telepaths; they carried out the law of mutation in that respect by heredity. It is explained that the Baldies were born wholesale by a cataclysmic violence in war. It is a foregone conclusion that the genes must be affected for such a widespread change. So far, the mutation theory holds true; change of genes and hereditary control of telepathy. So far—so good.

But producing telepaths by mutation lays the groundwork for an argument. There is no personal wrath in this "argument." I'm merely opening discussion on this particular subject. My main objection to calling them "Mutants" lies in the fact that it is conclusively agreed that telepathy is a natural acrement to every individual, that the faculty for mental communication is inherent in every brain. The fact that there are telepaths today, that there have always been telepaths seems to show that it is not a miraculous power provided by some divine providence but rather a natural development of the human body. Telepathy is not extraterrestrial. It is not even spiritual or supernatural.

Working on the basis that it is a natural development, then, it follows logically that these Baldies were not Mutants. Their power for facilitated mental communication was increased by this cataclysm; a sort of shell shock in reverse. Whether or not telepathy can be handed down to the children is a moot question, but even the fact their children *were* telepaths does not make them Mutants. Mutants, yes, in the loss of hair but not in the development of telepathy.

They are in a curious category. They show all the outward signs of being Mutants because they are a different species of Homo inasmuch as their children are telepaths, each one has no hair, and a finely drawn description of their characteristics would fit any one of them.

But a natural extension of telepathic powers, which is dormant in every fetus, puts them outside the Mutant range. Quite frankly, I would be gratified to have some other ideas on this. I hesitated about writing, but finally decided that the author, perhaps, or one of his consultants could explain this point.—Barbara E. Bovard, 1119½ South Kenmore Avenue, Los Angeles 6, California.

V-2 seen from the air.

Dear Sir:

Your letter from Jerry Shelton was very interesting to me insofar as his comments on V-1's and V-2's is concerned. I was in England during most of the V-1 blitz and all through that of the V-2. One bomber base from which I flew just happened to be in the path of V-1's going to London, so I saw quite a few of them going over—some with planes right on their tail. Most of them were flying at altitudes which I would judge to be between one and three thousand feet. A few dropped nearby and shook us up both physically and mentally.

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My earliest experience with V-2's, other than hearing a few distant explosions which were vaguely referred to as gas explosions, was the observance, early one morning shortly after takeoff, of a vertical contrail or smoke trail going up to about 60,000 or 70,000 feet over on the continent. After that we observed them at irregular time intervals from different altitudes and locations, mostly while on missions, but always from afar.

One day while I was piloting a fighter plane at two-thousand feet over the English countryside, I heard an explosion over the roar of the engine and the plane bounced as though we were in rough air. (We being the P-51 and myself.) I looked at the ground all the way around me and saw a big puff of smoke and dust rising from a large hole in a plowed field—practically directly beneath me! The V-2 must have gone by within 100 feet of my right wingtip. Gone by so fast I knew nothing of it until it exploded.

The most exciting experience I ever had with V-2's, though, was on March 24, 1945 at 17:00 hours. I was on my second mission of the day—it was on this day that our boys jumped the Rhine River and started the drive across Germany that ended the European war—over northern Holland with three other kids. As we were making a wide sweeping turn at about 25,000 feet, one of the kids yelled, "There's a V-2!" over the radio. I looked to my right and saw the telltale column of white vapor or smoke, and followed it up with my eyes. Then I did a double take. The thing was still going up and the projectile was very visible and very apparent at the head of the white column. This projectile was going at an angle of 45 degrees to the vertical and it left a trail up to an estimated 65,000 or 70,000 feet. I told you this partially as proof of the fact that the V-2 was visible in the light of day, and to correct Shelton's, " . . . you can't see one in the daytime. . . ." The discussion was carried on in *Stars and Stripes,* the Army newspaper, too. It was finally decided that they could be seen after several fellows wrote in to relate their experiences. Shelton should have said that he had never seen one in the daytime, or known anyone who had. I have.

So much for that.

I'd like to compliment you on "The World of Ā." It was marvelous. I waited anxiously, no, impatiently, for each succeeding installment. I'd like to have the complete novel under one cover.

When I arrived home recently to await separation from the Army, I was just in time to prevent my dad from selling all my *Unknown* and *Unknown Worlds.* I've been rereading them and I'm beginning to wonder when I can expect to find my favorite reading matter on the newsstands again. How about it? I want to see Cartier's, Hubbard's, de Camp's, Pratt's, Williamson's, Bond's, Leiber's, Rocklynne's, Cartmill's, and Farnsworth's names in print again.—William D. Hall, 6923 Agnes Avenue, No. Hollywood, California.

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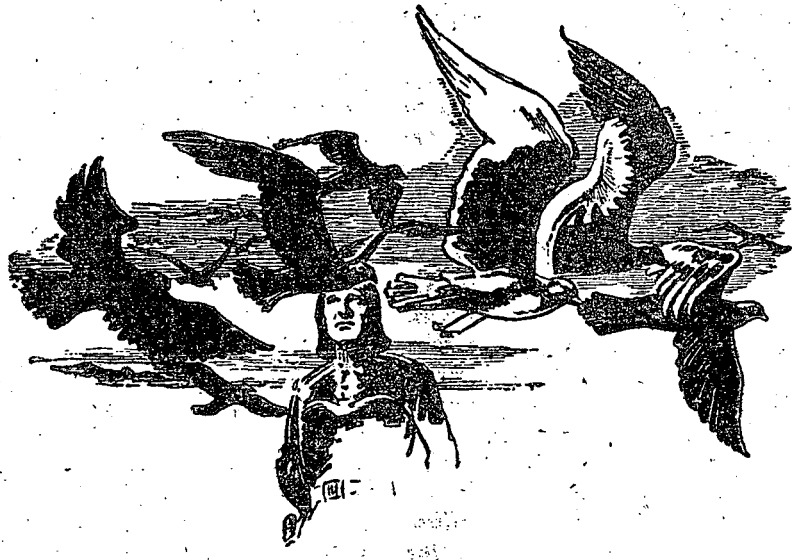
The Fairy Chessmen

by LEWIS PADGETT



***Concluding** Padgett's novel of a strange but very terrible sort of weapon—the concept that truth, like all other things, might be a variable, and our most basic laws but one of many possible aspects.*

Illustrated by Orban

SYNOPSIS

The doorknob opened a blue eye and looked at him. That was the first of a series of manifestations aimed at driving Robert Cameron insane. His face made ripples in the mirror; an altitude gauge smiled at him; the stairway had a non-existent top step—and Daniel Ridgeley, courier from GHQ, was apparently persecuting him.

The Falangists, a European nation, were at war with America. America had dug into the great, shielded cavern-cities like Low Chicago, where Cameron was Civilian Director of Psychometrics. For decades the war, planned by technicians and fought by robots, had been at a stalemate. But now the Falangists had a new weapon. They could do the impossible.

It was impossible for bombs to penetrate force-shields, but Falangist bombs penetrated American

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force-shields. Not many exploded. The ones that exploded were the Duds. The rest were analyzed and studied by technicians whose minds had been trained along lines of orthodox science. And the design used in the Falangist bombs was unworkable.

But it worked. The technicians had to discover why. They had to find a shield. That was their responsibility.

They went insane.

The bombs were one application of a basic equation apparently understood by the Falangists, but not by America. American technicians had the equation available. If they could solve it, the Falangists' greatest weapon would be blunted. But no mind trained along orthodox lines could solve an equation based on variable truth.

Faced by enormous responsibility, unable to crack the equation, the technicians began to go insane—in unusual ways. They could understand a few factors of the equation. There was Case M-204, who thought he was Mohammed, and who remained in a cataleptic state, floating a few feet above his bed. Through variable logic, he had nullified gravity. Others committed suicide. A technician-shortage was beginning. And this was a war of technicians.

Problem: find a type of mind that could solve the equation. Cameron, trained in applied psych, could locate such a mind. But if he knew the vital importance of his job, the responsibility might drive him insane too. If he himself tried to work out the equation, a psychosis would be inevitable.

So Seth Pell, Assistant Director, and Ben DuBrose, Cameron's secretary, combined to keep their chief in ignorance of the importance of the problem. It wasn't easy. Kalender, Secretary of War, was a brass hat and insisted on dealing with the director. Pell and DuBrose refused to permit communication. Daniel Ridgeley, Kalender's courier, tried to force his way into Cameron's office. And Ridgeley, Pell thought, was neither American nor Falangist. He had come from another time period.

There was no real evidence, except indirectly. Twenty-two years before, seventy-four huge, impenetrable domes of mirror-silver had appeared out of nowhere, all over America. They had held their secret perfectly. Now they were tattered and split, though still impenetrable; and it was possible to see that they held nothing at all. Only one investigator had contended that shortly after their appearance they had emitted hard radiations for an hour. Nothing else. But those radiations had caused mutations among the children born in the vicinity of the silvery Duds, and Billy Van Ness was one of the mutations. He was in Low Chicago, being examined by Seth Pell.

Van Ness had seemed normal until maturity. Then he had gone insane. Through hypnosis, Pell and DuBrose discovered the reason: The Duds had held beings from an unimaginably distant time-sector, creatures utterly remote to genus

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homo. They were genus X. The hard radiations might have been simply their means of communication. They had come back through time searching for something—impossible to guess what—and had failed to find it. So they had died. But Billy Van Ness was one of the mutants who had inherited a certain sense from genus X; the hard radiations had altered him before birth, and the latent alien talent had emerged when he matured. He had ETP—extra-temporal perception. He could see duration. And he had gone mad.

Under guided hypnosis he could talk rationally. He had given DuBrose and Pell one clue; he had said that Ridgeley's duration was immensly longer than that of any contemporary. Ridgeley, too, Pell thought, had come from the future. But his motives were obscure.

Dr. Emil Pastor, physicist, was beginning to solve the equation. In his eyrie lab in the Rocky Mountains, he told Pell and DuBrose that the effect of the equation was to suspend the laws of logic. A free-falling body might have a variable rate of speed. Scientific constants were used as variables. But if Pastor didn't go insane, he could crack the equation—he said.

DuBrose worried. Pell told him to go to Blue Heaven and get an emotional catharsis at that hedonistic pleasure-palace, but DuBrose preferred to worry. If he had known what was happening to his chief, he'd have worried harder. For the Falangists were still trying to incapacitate Robert Cameron. His anxiety neurosis was building up to psychosis as he sat down to lunch, lifted a spoon to his mouth—and the spoon kissed him.

Seth Pell was in Ben DuBrose's office when Dr. Emil Pastor televised. Pastor announced his discovery; everything was hollow, and he could make anything vanish by applying will power. He had already destroyed his laboratory, he said—

He was insane. The equation had smashed him. When Pell became curious, Pastor demonstrated his power. "Like this," he said, pointing to Pell and concentrating. "You don't exist—"

Seth Pell vanished.

VII.

The office had not changed. That seemed a minor miracle, somehow. The desk might have sprouted wings, the televisor could have scampered off on its bulky plastic base, and the White Queen should have jumped into the soup tureen. But the office was the same. The background to illogic remained cold, familiar logic. Emil Pastor's gnomish face blinked at DuBrose from the visor screen, and beyond it Pell's door stood half open.

"Like that," Pastor said quietly. "That's how I do it, Mr. DuBrose."

Psychosis unclassified—but a tentative prognosis was possible. The impossible part of it was that Pastor's psychosis was founded on paradox. He was insane and believed he could make things stop existing by applying will power.

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He could do it, too. Seth Pell had—blinked out.

DuBrose didn't want to move. The numbness of shock held him. But slowly his mind began to work again, and to see the danger. If someone came into the office now—the director, or anyone at all—Pastor's precarious balance might be upset. The man was responsible, and he held a bomb that could blow up—

All creation?

Habit takes over when the planning faculty is paralyzed. Dimly DuBrose sensed that there were a dozen things to be done, but first of all it would be necessary to pacify Pastor. Though it had been years since his internship in Psychometric Base and the sanatoriums, old habits came to his aid. He knew he was facing a patient.

Deliberately DuBrose let his mind go blank. He studied Pastor's face. Visible symptoms? Case history? That eyrie lab in the Rockies, with its clutter of ill-assorted furniture, the nonconventional color "stories" on the Fairyland projector, the very fact that Pastor had settled on this particular wild talent of controlled obliteration out of the variety of powers the equation apparently could bestow—adding up to what? There was a key to the man's personality somewhere, a familiarity he had not sensed until now.

Sentiment. That picture of Pastor's wife and children—an emotional appeal?

Essential amorality, lack of empathy, tremendous egotism, that could enable Pastor to wipe a man out of existence with utter casualness. As a child destroys a toy.

A child is to a toy as Dr. Emil Pastor is to mankind—

That was it. The subconscious motive. The murderous quintessence of rationalization. A madman will believe himself to be Christ, wound himself with the stigmata, and thereafter sincerely believe that the scars have appeared spontaneously and miraculously. Corroborative evidence. But Pastor's mind had worked more clearly. First he had chosen and acquired the power that would prove the reality of his rôle; as yet he might not even have realized consciously that he was God.

The ultimate paranoid egotism. Perfectly rationalized insanity!

Pastor said, "Didn't you see what I did? You weren't watching—"

DuBrose was rather surprised that he spoke instead of screaming. "Oh, I saw it. It surprised me, that was all. My reaction was pretty complicated. There's an instinctive attempt at rationalization." He was choosing carefully the words with useful emotional indexes.

Pastor looked surprised. "But rationalization with what? You can't do it. Only I can. You can't possible perceive that everything's hollow as a soap-bubble. You instinctively accept the expected. I'm able to do this because I'm skeptical."

"That's true, I guess," DuBrose said. Too facile agreement would strike the wrong note; but provoking an argument would be dangerous, because the physicist could so

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convincingly demonstrate the truth of his argument. "Anyway," he went on, "I'm glad you remembered to vise me. You've an almost miraculous power. Or—is it miraculous?"

Pastor smiled. "I don't know. I'm still surprised. I don't really know the extent of my power."

"It's a responsibility, I can see."

The physicist didn't quite like that. He scowled a little. DuBrose went on quickly, "I'm not presuming to inquire about your plans—" He had almost used the word *advise*. But he had suddenly found a key to Pastor's personality; there was a parallel of sorts in history—an isolated mountain retreat, cluttered with disorganized and tasteless furniture—a magpie's nest—and a man who studied occultism instead of composing unorthodox color-treatments. Dr. Emil Pastor had much in common with the German Hitler.

Pastor said doubtfully, "My plans? I don't want—" He hesitated.

"I'm extremely interested," DuBrose said. "You can do miraculous things, Dr. Pastor. But you know much more about the possibilities than I do. You remember you showed me one of your Fairyland compositions?"

"Yes," Pastor said. "You didn't pay much attention, though."

"I wanted to see more, but I knew you were busy. I did see enough to realize what sort of creative mind you must have. And now you'll be able to compose on an indefinitely larger scale."

Pastor nodded. "I've just been destroying some things so far. Do you think that was wrong? I don't know if I can *create*—"

"Right and wrong are arbitrary values. They can be transcended." Dangerous words, but necessary. DuBrose was trying to work on Pastor's subconscious, which knew it was God, even though the conscious mind had not yet felt the impact of that delusion. "As I said, I'm very glad you vised me. I appreciate it. And, while I don't know what you intend, I'm sure it will be—remarkable. I'll be expecting an extraordinary composition."

Pastor said helplessly, "But I haven't made any plans yet."

"The power is still new to you. You'll need to learn how to handle it to the best effect, I suppose—is that right? Even if you make a few mistakes through being hasty, it won't matter—right and wrong are arbitrary. But I would like to see what you'll do. Would that be possible?"

The flood of words had disconcerted Pastor. "You're seeing me now."

"The visor screen's limited. Would you let me come to your lab by copter? Don't forget," DuBrose said, "you can do exactly as you want. Nobody can stop you now. Forget my ideas if you don't like any of them. I can't help being enthusiastic. Sometimes I talk before I think. I've often jumped the gun and regretted it. If I were smart, I'd plan my moves in advance. But—" He shrugged.

"Planning's wise," Pastor said.

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"Yes, it is! I want to think." The screen suddenly went blank.

DuBrose took a few steps and caught the edge of his desk. His whole body began to shake uncontrollably.

He got that under control and vised Wyoming Emergency again. The same medic in charge came on.

"Has that ambulance copter gone out for Pastor yet?"

"Hello, Mr. DuBrose. Yes, we sent it out stat. You said emergency."

"Recall it. Double emergency. Don't let your men get near Pastor."

"But if he's psychotic—is he a violent case?"

"He's homicidal en masse," DuBrose said grimly. "But as long as he's sitting on top of the Rocky Mountains, it's O.K. I hope. I don't want him disturbed. *He mustn't be disturbed.* Recall that copter!"

"Right. I'll call you back."

DuBrose said, "Yeah," broke the connection, and put in a call to the Secretary of War. When Kalender's heavy, hard face appeared on the screen, DuBrose was ready.

"I need help," he said. "You're the only man who can authorize this, Mr. Secretary. It's extralegal. But it's absolutely vital."

"You're Ben DuBrose," Kalender said. "Well? What is it?"

"Dr. Pastor—"

"Has he solved the equation?"

"He's gone insane," DuBrose said, Kalender grimaced.

"Like the others. Well—"

"Worse than the others. You remember that sanatorium case—M-204? The one who could nullify gravity. Pastor's got hold of a power a lot more dangerous."

Kalender's harsh face changed. Brass hat though he was, he was competent in his job.

"How dangerous? Where is he?"

"His Rocky Mountain lab. I just talked to him on the visor. I think he'll stay put for a little while anyhow, making plans. And he's expecting me. A copter can rocket down and blast him before he has time to retaliate."

"Retaliate how?"

"By making the copter disappear," DuBrose said carefully. "By making the Rocky Mountains disappear or by making the whole world disappear."

Kalender's lips parted. His eyes tightened.

DuBrose said, "I'm not insane. I haven't been working on the equation myself. Pastor showed me proof, that's all. Put a scanning ray on him, but be careful he doesn't detect it. He's destroyed most of his lab already."

"That's fantastic," the Secretary of War said.

The visor hummed. DuBrose twisted a dial, saw a cameo face blink into view at one corner of the screen, and instantly snapped it blank again. He nodded at Kalender.

"Pastor. Calling me back. Oversee this."

Kalender's face faded as Pastor's gnomish features checkered into a

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recognizable pattern. "Mr. DuBrose?"

"You just caught me. I was about to leave—"

"Don't come. I've changed my mind."

"What?"

"I thought it over," Pastor said slowly, "and I saw the possibilities. I hadn't quite realized before. I was intoxicated. At first. But when I sat down and tried to make plans, I realized what having this power means. I'm not going to use it. I'm not meant to use it."

DuBrose said, "You've decided that?"

"Don't you agree?"

"I can see you must have your reasons. May I hear them?"

"I think this may be—a test of humility. *I* know I have the power. That's enough. I know all things are hollow. That's enough too. On this mountain I have been shown the kingdoms and powers of the world. I have been tempted. But I'll never use the power again."

"What do you intend to do?"

"Think," Pastor said. "Thoughts are the only real things in a hollow world. Gautama knew that. I'm wiping out my past. I was too much concerned with the hollow things . . . technology—" He smiled slowly. "So I won't need to use my power. It was given to me as a test. And I survived that test. I know that meditation is more important than anything else."

DuBrose said, "You're wise, I think. I agree with you."

"You can see why I mustn't use the power again."

"Yes," DuBrose said, "you're right. And it's symbolic that you destroyed your laboratory. It was the symbol of your past, and I believe you were meant to destroy just that much."

"Do you think so? Yes, I suppose . . . yes. My past has vanished. I can go forth without chains to a new life of meditation."

"Did you destroy all the past?"

Pastor brought his eyes into focus. "All my—what?"

"The laboratory. If you leave one part of your past still alive, it'll be a bond, won't it? And the lab is the symbol."

Pastor said, "One wall still stands."

"Should it stand?"

"But I swore never to use the power again. It won't matter."

"The symbol represents the truth," DuBrose said. "It will matter. You must start fresh. A single bond now—"

"I won't use the power again!"

"You haven't completed your task. The power was given to you so you could destroy the symbol of your past. Until you fulfill that command you won't be free. You won't be able to enter into your new life."

Pastor's mouth twisted. "I . . . must I? Do you believe . . . that was what was meant?"

"You know it was. The last symbol. Destroy it. *Destroy it!*"

"All right," Pastor said. "But it's the last time I'll ever use the power."

DuBrose said, "Push the visor away so I can see the wall go, will

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you? I want to be sure of your complete success."

Pastor's face slid aside; there was a shifting panorama, and then the half-ruined wall of the laboratory stood against a cold gray sky. DuBrose said, "Stand where I can see you. Now."

"Well . . . but . . . DuBrose, must I—"

"You must."

Pastor looked at the wall.

The wall vanished.

"Good," DuBrose said. "The last symbol is gone."

Pastor's face was puzzled. "No. I forgot—"

"What?"

"The visor. *That's* the last—"

The screen went blank.

Kalender's face came back. The Secretary of War was sweating.

"You're right. DuBrose. That man can't stay alive."

"Then have him killed. But be careful. You'll have to catch him by surprise."

"We'll manage." Kalender hesitated. "Why did you talk him into destroying that wall? Just to convince me?"

"Partly."

"But he was determined not to use the power again—"

DuBrose said angrily, "I had to be sure. He meant it then. But how long could he have held out. If *I* was able to talk him into using the power, the devils in his subconscious mind would eventually have done the same thing. If he had refused to destroy that wall, no matter how much I urged him, I might have figured it would be safe to let him live. Though even then—"

"He can destroy—anything?"

"Anything at all," DuBrose agreed. "Or everything. And since he's broken his word to himself once, he'll do it again. Kill him. Fast. Before he can get off that mountain."

"I'll send a warplane from Denver," Kalender said. "I'd like . . . there's no time now, though. Good-by."

As his face faded, the medic at Wyoming Emergency called.

"I recalled the hospital copter, Mr. DuBrose—"

"In time?"

"Yes. They'd gone only a few miles. But have you made other arrangements, or—"

DuBrose said, "Other arrangements have been made, yes. Forget the affair. Good-by."

He clicked the visor off.

The room was empty and silent. The window ports showed the blue sky and sunny meadows of a hillside landscape miles above Low Chicago. Time slowed down and stopped.

Then he knew that Seth Pell was gone.

VIII.

No one else must know. Seth's disappearance must be explained away, somehow, for a while. Because no hint of the real problem must reach Cameron; the director had to be shielded from realization of his responsibility, or he would go mad.

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There was not even time for grief.

DuBrose went into Pell's office and stood silent, considering. The room's vacancy chilled him. An hour ago Seth had been sitting on that desk, swinging his heels and talking in his lazy, casual voice. Suppose DuBrose, not Pell, had been Pastor's victim? How would Seth have reacted?

With competence, anyhow.

DuBrose fumbled out a cigarette, stared at the desk, and tried to imagine Seth sitting there, white hair gleaming under the pale lights, youngish face faintly amused.

"How about it, Seth?"

"How about what?" Yes, that was it. Careless, casual, but—

"You know what. You're dead."

"O.K. So you're in charge. Take over, Ben."

"But how? One man can't—"

"Oh, stop worrying. You'll do all right. It's only that sense of responsibility that can break you. You had one idea already. The chief mustn't know I'm dead."

"He'll want to know—something!"

"Well, tell him something. Use your memory. Didn't I anticipate trouble?"

"Not this trouble. You did with Ridgeley."

"So?"

"Yeah. You said you'd put some papers in your safe, just in case. And the chief's got the combination."

"Smart boy. This is a good trick, you know. You're so used to kicking ideas around with me that it's hard for you to think on your own. O.K. Imagine me any time you want. Put words in my mouth. It'll help a bit."

It had helped. Seth wasn't sitting on the desk. He hadn't been sitting there. But, briefly, DuBrose had re-created Seth Pell as surely as Pastor had destroyed him.

DuBrose headed for the director's office. Cameron was at the window; he had slid aside the pane and was watching the shadowy, red-lit darkness of the Spaces. Thunder of the great machines came through the port. DuBrose saw that Cameron's luncheon hadn't been touched.

"What is it, Ben?"

"I'd like you to open Seth's safe."

Cameron turned. His face was under iron control. "Why? Where's Seth?"

DuBrose said carefully, "I just got a message from him. He wants you to open his safe. That was all."

Cameron hesitated, smoothed back his gray hair, and grimaced. Without a word he went past DuBrose into Pell's office. The safe was a dual-control, attuned to open only to the radiation pattern of Pell's brain or Cameron's.

The panel slid aside. A bulky envelope was propped up against a shelf. It was addressed to Cameron, who slit it open and took out a paper and another thick, sealed envelope.

The director's eyes moved swiftly across the letter. He handed it to DuBrose.

DuBrose read:

Bob,

I've been called away. Can't tell you details yet. Till I get back, let Ben take over. He knows the set-up. Give him

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full charge. If he isn't available, open this envelope yourself. See you later.

Seth

Cameron held out the envelope. "Here it is. Now—what is all this funny business?"

DuBrose said, "First of all, are you going to do what Seth wants?"

"Yes. He knows what he's doing."

"He gave me my orders."

Cameron smiled. "I'm in danger of being assassinated? Is that the answer?" Pell had led the chief to think that, DuBrose knew, to keep him from guessing the truth. As a red herring, it might prove useful.

"It might be the answer. Or it might not."

"I'm not a child, Ben."

"Chief, I'm just following Seth's orders."

"All right," Cameron said abruptly. "Go ahead and follow them. Let me know any time you want my resignation." He took a folder out of the safe and said, "I'd meant to ask for this back. That new propaganda line . . . it may need some work."

Harmless stuff. DuBrose knew what it was. He watched Cameron's broad back out of the room.

The director had forgotten to close Pell's safe. DuBrose shut the panel himself, frowning speculatively. The action wasn't at all like Cameron. He was meticulous about details. And he was a hearty eater.

Yet he hadn't touched the luncheon tray.

Had Cameron learned the truth, somehow, after all? Was an anxiety neurosis beginning to work?

Symptoms: absent-mindedness, loss of appetite—

Cameron glanced at the papers outlining the new indoctrination lines, but he couldn't focus on them. His mind wasn't under its usual tight control. He was conscious of the luncheon tray on the desk, and the soup spoon that had behaved so —abnormally.

Automatically he scrubbed the back of his hand across his mouth.

There was a pattern to all these things. All these hallucinations. They were aimed at making him feel insecure.

Aimed?

A directive purpose?

Persecution, then. Why dodge the word? A persecution mania. What would a psychiatrist say?

It was either hallucination or it wasn't. If it wasn't, it was persecution. Or—

It was difficult to think clearly when at any moment the floor might tilt unsteadily beneath your feet.

Impossible to work on the propaganda papers now. Cameron shuffled them back into their folder and went to his own wall safe. He opened it.

There was an egg in the safe.

Cameron knew he hadn't put it there.

It wasn't a real egg either, because as he reached for it, it went away—somewhere.

Seth had written:

Ben,

Anything can happen now. Ridgeley's found out we know he's from the future,

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and he's plenty dangerous. I'm allowing for the possibility that I'll be killed and you'll survive. If we're both killed—well, you won't be reading this.

But play it this way. The equation's got to be solved, and the chief's probably the only one who can find somebody to solve it. Maybe Pastor will do the trick. Maybe he won't. He's got further than anyone else so far. Keep screening, and do your best for the chief.

And don't let this throw you. In a few million years, what will it matter? Luck, though!

Seth

The other papers in the envelope were the equation itself and the research material Pell had gathered on it. None of it was new to DuBrose. He sat back and considered.

Seth was dead. (I'll mourn you later.)

Daniel Ridgeley was alive. DuBrose had almost forgotten the courier. At the moment, he could be discounted, though not permanently. The Secretary of War might help on that score. Ridgeley might be in the pay of the Falangists. Though why a man from the future would bother with temporal-local wars DuBrose could not imagine. Why did Ridgeley apparently feel *pleasure* when he faced enemies? It had been that, an odd, illogical delight that had flamed behind the courier's dark eyes when DuBrose had pulled a vibropistol on him, and when Pell had managed that business last night, when Ridgeley had been dissuaded from murder.

Billy Van Ness and his ETP—extra-temporal perception; could Billy, in his few lucid moments, help? How? By locating Ridgeley? Finding the courier wouldn't be enough; DuBrose thought the key would be motivation. And that motive might lie thousands of years in the future, in the world from which Ridgeley had presumably come.

Well, then—the Duds? The monuments of that lost race from the inconceivably far future, now tattered, dissolved domes of impermeable force? Nothing there.

The equation.

Pell had proposed it to the chief as a casual theoretical problem. Who could solve a formula based on variable logic? And Cameron had named Lewis Carroll—a thoroughly elastic mind, one not bound by conventional values.

But no mathematicians existed today who wrote fairy tales of symbolic logic. DuBrose had already used the big files for a screening on technicians by a vocation. He hadn't found much. One mathematician seemed a possibility; he was a sculptor of mobiles, but he was also one of the men who had gone insane while studying the equation.

Pastor had gone further than most. DuBrose decided to attack the problem from a new angle. If he could pick out the factors that had made Pastor nearly successful in his attempt, there might be an answer there.

He made a psycho-chart, omitting the name, and noted a few questions. Cameron could probable get something out of this pattern. But DuBrose dared not take the chart in

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now. The director would certainly smell the concealed rat.

He shoved the chart among some other routine folders waiting Cameron's decision and sent them into the director's office. Now he could only wait—on that point anyway.

"What next, Seth?"

"I can't tell you anything except the words you put in my mouth. You know that. Remember me. Visualize me. Think what I might say."

"I'm trying to."

"Get drunk. Eat some Kix. Take Deep Sleep for a year. Use that blue key I gave you. Try some high-powered hedonism; it opens the right doors for that."

"Escapism. I'd be trying to dodge responsibility."

"Semantic trouble. Your responsibility's limited to keeping the chief on the beam. He's the guy who can keep the works from blowing up. But don't let him know that."

"Maybe if I checked over those screenings again—"

"Maybe."

DuBrose did that. He drew up some charts, ran off several lists, and studied them. Avocations: badminton, baseball, bowling. Cards—a whole sub-group. Oil painting, surrealistic, classic, tri-dimensional. Writing Creepies, the sensory "movies" of the period. Chess, several varieties. Were there several varieties? What was fairy chess, anyhow? Rabbit raising. Hydrosphere exploration. Adagio dancing. Dipsomania.

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DuBrose thought the dipsomaniac sounded like the best bet.

Then Kalender vised. He had bad news. The warplane sent to blast Dr. Pastor had failed; Pastor couldn't be located.

DuBrose began to feel like a target aimed at by a dozen expert archers. "I won't ask if you've done everything possible, Mr. Secretary. You know the importance of this as well as I do."

"We've put scanning rays on the whole area, and psych-radar detectors, tuned to the frequency of the adult mind. No response."

"Pastor's instruments didn't work on M-204. It's possible that Pastor's mind is running on a different frequency now."

"Well—we've done infrared aerial pix, and picture-series to check on ground movement. Nothing but deer and a few pumas. There's a copter registered to Pastor. It can't be located. Did he have it on the mountain with him?"

"Maybe. He might have destroyed it. You've sent out an alarm?"

"A kill-on-sight priority alarm, Mr. DuBrose. It's a general alert."

"The first shot must be mortal, you know. If Pastor retaliates—"

"I've seen what he can do," Kalender said, moving his mouth stiffly. "What I want now is suggestions. Let me talk to the director."

DuBrose said, "I can't. I'm sorry. He gave orders, you know—"

"But this is emergency!"

"I know it. But it's equally vital that Mr. Cameron be kept isolated from such things for a while."

Kalender flushed darkly. After a moment he said, "Then put on Seth Pell."

"He's unavailable. I'm in charge in his absence." DuBrose went on without waiting for an explosion. "Pastor might head for his home. I think he's emotionally attached to his family. He may go there either to be with them, or to destroy them. They're symbols of his past, too. He promised not to use his power again, but . . . I suggest spotting some logicians with your blasting crews, in case of trouble. Pastor's weakness seems to be metaphysics. A good logician might be able to argue him out of retaliating. Though the only safe way is to kill him on sight."

"Mm-m— That makes sense. All right."

"One more thing." DuBrose had made his decision. "Record this, please. Daniel Ridgeley's a spy."

Kalender jerked back. "What? Im—"

DuBrose's back stopped crawling. "Wait," he said, letting out his breath. "I had to get that recorded fast. I didn't know if Ridgeley might kill me before I could get the words out. But it's on the record now. If he murders me, you'll get on his trail."

The Secretary of War said slowly, "Mr. DuBrose, what's the matter with your department? Are you having mass hallucinations in Psychometrics? Ridgeley has been invaluable to us—"

"Hallucinations? Is Pastor's power imaginary? What's so fan-

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tastic about Ridgeley's being a Falangist spy?"

"I—*know* Ridgeley. I trust him completely. You don't know what services he's rendered—"

"Will those services save us from the Falangist equation? Sure you trust him. That's what he was after. Remember those occasional periods when he drops out of sight? Do you know what he does during those times?"

"Of course . . . eh?"

"Remember this," DuBrose said. "Ridgeley is a lot more dangerous than Pastor. I can't ask you to pick him up or have him killed. I don't think it would be possible. But I'd like you to stand ready. Locate Ridgeley; don't let him know he's spotted. Put a scanner on him and keep it there."

Kalender rubbed his jaw. "We can't take chances. So I'll do as you suggest. But—when can I talk to the director?"

"You'll be the first one to talk to him, as soon as it's safe. Right now he must be kept isolated. It's a security precaution. You know the effect the equation has on people—"

The Secretary was finally beginning to understand. "There's been another suicide. An electronics man. And two more insanity cases. Not counting Dr. Pastor."

"The equation should be suppressed till we—"

"Impossible. It must be solved. You don't know your office will succeed. As long as there's a chance that someone may solve that—thing, we've got to take the chance."

"Even if it drives every technician in the country crazy," DuBrose said.

"I don't like it either. Keep in touch with me."

That was all. DuBrose eyed the window port. Claustrophobia touched him chokingly. At any second, all this might dissolve—

Pastor was loose—somewhere. And until his brain was blasted into nothingness, there would be no safety for anything or anyone, anywhere.

He sent another batch of material in to Cameron and tried to conjure up the image of Seth, without too much success.

"What now?"

"How should I know?"

"I can't rush the chief—"

"Naturally. He mustn't suspect the importance of the equation."

"What about Pastor?"

"Done everything you can?"

"I'm not equipped to find him. I've condemned him to death already. Isn't that enough?"

"What about Ridgeley?"

"Oh. Well, the more information I can get about that guy—"

Billy Van Ness had a private room in the infirmary. DuBrose went there to study the boy's chart and examine the patient. The excitement caused by Ridgeley's arrival last night had worn off. Van Ness was in a passive state, eyes closed, thin face relaxed.

ETP. Extra-temporal perception might prove valuable in dealing with a man from another time-sector. Pell has spoken of hypnosis,

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had tried it on the boy, with some success. DuBrose ordered gadgets brought in and used mechano-suggestion on Van Ness. When that failed, he had recourse to an injection.

"K-k-k-k-kuk!"

The harsh, unpleasant noise rasped out of the boy's throat. DuBrose remembered the palate deformation. Was this sound the equivalent of hard radiation emanations made audible—the probable method of communication used by that unknown race that had created the Duds?

He probed. This time it was easier to make Van Ness speak intelligibly. Pell had broken trail last night. But the temporal disorientation was still present. The mutant made no distinction between past, present and future. Some sort of temporal anchor was needed to pin down Van Ness' wildly oscillating perception. How strange the world must seem to this mutant who never used his eyes! He could see *duration*—

"—living and then backwards in long extension and stop . . . and again backwards, and again—"

Question.

"Shining. Bright domes. So long they reach to—"

Question.

"No word. There is none at the end. Or the bend, I mean. Where they doubled back. Came to look for—"

Question.

"There is no word. Back and back, searching."

Question.

"Where are they now? . . . The end is now."

DuBrose thought. Genus X, the race that had built the domes, that strange unimaginable people that had traveled back through time and left the shining, tattered Duds as their eidolons. He wondered. Searching for what?

For something necessary to their existence. And failing to find it. Back through time, in age-long leaps, back to this world that must have seemed so primevally alien to genus X. But the end is now.

"The man you saw last night, Billy—"

"K-k-k-k-kuk!"

Saw? Last night? To the mutant, the words were variables. DuBrose tried to frame his question more narrowly.

"The man. He reached in the right direction, remember?" Would it be memory or prescience to Van Ness' warped, expanded time-sense? "He was longer than anyone else. Except the shining things. He was more complete—"

"Running, running . . . I saw him run. There was a fight."

"A fight, Billy? What kind of a fight?"

"K-k-k-kuk! Too short to see—those big machines. Oh, big, big, but so short!" Immense machines of brief duration. What could they be?

"Noise. Sometimes. But sometimes silence, and a place where many lives were short—running, running, as they come . . . came . . . will come . . . *k-k-k-k-uk! K-K-K-K-KUK!*"

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The first symptoms of convulsion began to appear. DuBrose hastily gave another injection and calmed the boy with deft hypnotic suggestion. The racking shudders died. Van Ness lay motionless, breathing shallowly, his eyes closed.

DuBrose went back to his office. He was in time to meet Cameron tossing some papers on the desk.

"I'm going home, Ben," the director said, "A bit of a headache. I couldn't do much with these problems. Managed a few. Where's Seth?" He watched DuBrose's face. "Never mind. I—"

"Nothing's wrong, is there?"

"No," Cameron said flatly. "I'll see you later." He went out, leaving DuBrose to wonder. Had Ridgeley got to the chief again?

Symptoms: headaches, nervousness, inability to concentrate—

DuBrose hurriedly leafed through the folders, looking for one in particular. He found it. But the dossier on Dr. Emil Pastor had apparently not been touched. Maybe those other screening charts listing the avocations might—

Nothing there either. Or wait. Opposite one name there was a lightly penciled check mark.

Eli Wood, Low Orleans, mathematician; home, 108 Louisiana B-4088; avocation, fairy chess—

IX.

None knew him. He was grateful; he felt deep humility because he could walk through the Ways of Low Denver and not be recognized for what he was. The Ways swept past, crowded with warmen, but no one watched the small, quiet figure strolling on the stationary central path. This was the second test, and probably a more difficult one than the first. Destroying the symbols of his past had been dangerously easy. The temptation had been there. Because he knew, now, that all things were hollow, he also knew how easy it would be to prick the world bubble.

For he could not die. His thought would live on. In the beginning was the Word, and in the end would be the Word, too.

He had wanted to go home, but this test must come first, and Low Denver had been the nearest cave city. His credentials had enabled him to enter. He had used those credentials just as though he were an ordinary man. And he would go on pretending that, in all humility. Only his thoughts, the thoughts of God, would blaze between the stars, the hollow stars, into the hollow universe that he could destroy—

That was the test. He must never use the power again. How often the other God must have been tempted to erase the universe He had made! But He had refrained, as Dr. Emil Pastor must refrain.

He would still call himself Dr. Emil Pastor. That was a part of the program of humility. And he would never die. His body might, but his thought would not.

All these warmen on the Ways—how grateful they would be if they knew they continued to exist only by the loving-kindness of Dr. Emil

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Pastor. Well, they would never know. Pride was a snare. He didn't want altars.

The firmament was an altar revealing the glory of Dr. Emil Pastor.

An ant crawled out of a crevice and raced toward the Ways. Pastor chased it back to safety. *Even an ant—*

How long had he stayed here? Surely there had been time enough. He had passed *this* test of humility; nothing had tempted him to reveal himself to the warmen of Low Denver; he wanted to go home. He hoped his wife would not realize the change. She must always continue to believe that he was Emil-dear, as the children must never guess he was anyone else but Dad. He could play the role. And he felt a surge of tenderness toward them because he knew that they were hollow.

They could vanish—if he willed it.

So he must never will it. He would be a kindly god. He believed in the principle of self-determination. It was not his task to interfere.

Time enough had passed. He stepped on a Way and was borne toward one of the pneumocar stations. In the car, he clutched a strap—the acceleration always did odd things to his stomach—and leaned back, waiting for the brief blackout to pass.

It passed. Fifteen minutes later he stepped out at a Gateway. A group of uniformed men were standing waiting. At sight of him an almost imperceptible tension touched them. But they were well trained. Not a hand moved toward a pistol.

God walked toward them.

Cameron was dining with Nela. He watched her calm, friendly face and knew that there was no sanctuary even there. As he watched, the flesh might melt from her skull and—

Music murmured from an audio. Fresh pine-scent filled the room. Cameron picked up a spoon, dropped it again, and reached for a water goblet.

The water was warm and brackish. The shock to his taste buds was violent. But he managed to set the glass down without spilling more than a few drops.

"Jitters?" Nela asked.

"Tired. That's all."

"You were like this last night. You need a furlough, Bob."

"Maybe I'll take one," Cameron said. "I don't know—"

He tried the water again. It was freezingly cold and very sour.

Abruptly he pushed back his chair. "I'm going to lie down for a bit. It's all right. Don't get up. A bad headache is all."

Nela knew how he hated fussing. She merely nodded and went on eating. "Call me if you want," she said, as Cameron went out. "I'll be around."

And then upstairs, in the bed that at first was pleasantly soft and relaxing, and then too soft, so that he kept sinking down and down into a feathery, pneumatic emptiness,

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with that nausea in his stomach that droppers always gave him—

He got up and walked around the room. He didn't look into the mirror. The last time he had done so, his image had made ripples in the glass.

He walked.

He was walking in circles. But presently he noticed that he was always facing the same spot, the same picture on the wall. He was on a turntable.

He stood motionless, and the room tilted. He found a chair, closed his eyes, and tried to shut out all sensory impressions.

Hallucination or reality.

If reality, then it was more dangerous. Were Seth and Ben DuBrose involved? Their hints about assassination were palpable red herrings. He might have believed them under other circumstances. But these *hallucinations*—

It was difficult to think clearly.

Perhaps that was the intention. Perhaps he wasn't intended to think clearly.

Half-formulated thoughts swam into focus. He had to pretend to believe that these—attacks—were purely subjective. He had to pretend that they were succeeding in their purpose—

But he knew that the psychic invasion was objective.

He knew that he was being persecuted. Others might not notice the things that had been happening to him. The persecutors were clever. They were determined to drive him mad—well, why? Because he possessed information of value? Because *he* was a valuable key man?

And that argument added up to one thing. Paranoia, with systematized delusions of persecution.

Cameron got up carefully. He winced. Once again it had happened. And, as usual, the unexpected.

He went downstairs, walking slowly and awkwardly, his face drawn and gray. Nela caught her breath at sight of him.

"Bob. What's wrong?"

"I'm flying to Low Manhattan," he said through stiff lips. "A doctor there I want to see—Fielding."

She came swiftly toward him. Her arms slipped around his neck.

"Darling, I won't ask any questions."

"Thanks, Nela," Cameron said. He kissed her.

Then he went out to the copter, walking unsteadily and remembering the fairy tale of the little mermaid who exchanged her fish-tail for human legs. There had been a price exacted. Ever after that, the little mermaid walked on sharp knives, no less painful because they were imaginary.

Wincing at every step, Cameron walked toward the copter's hangar.

"I don't drink," the mathematician said, "but I've some brandy I keep for guests. Or do you prefer Pix? I've got some somewhere. I don't use them either, but—"

"Never mind," DuBrose said. "I just want to talk, Mr. Wood." He laid the portfolio across his knees and stared. Wood sat rather un-

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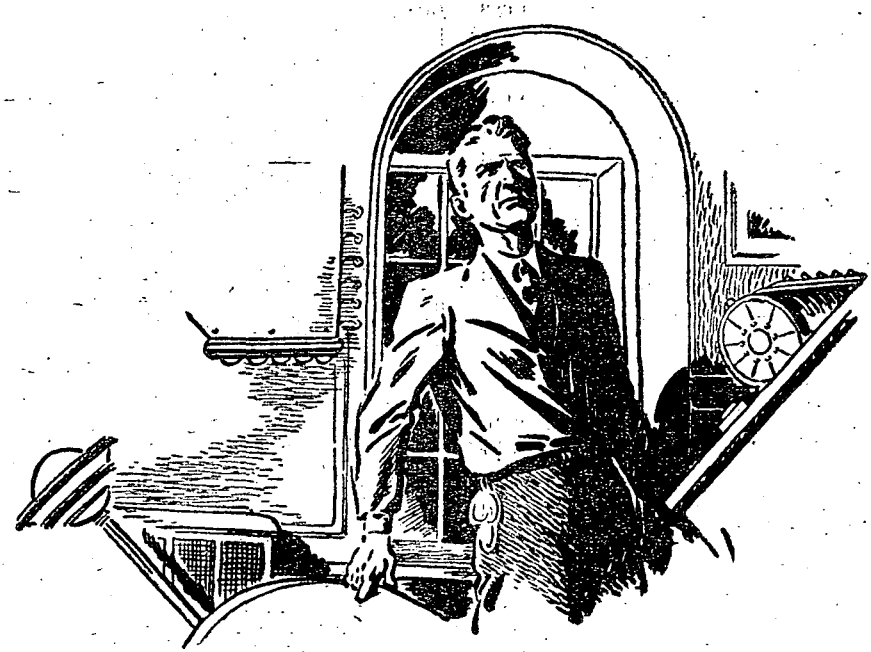

easily in a plain relaxer chair, a tall, thin man with old-fashioned non-contact spectacles and a thatch of neatly-combed, mousy hair. The room was meticulously, fussily clean, an odd contrast to Pastor's cluttered, garish eyrie lab.

"Is it war work, Mr. DuBrose? I'm already working in Low Orleans—"

"Yes, I know. I've investigated. Your record shows you're extremely capable."

"Why—thanks," Wood said. "I . . . thanks."

"This will be confidential. We're alone here?"

"I'm a bachelor. Yes, we're alone. I gather you're from Psychometrics, though. That's rather out of my line."

"We have our fingers in a lot of pies." Watching the man, DuBrose found it difficult to believe how many degrees Wood held and how many papers had been published under his name—some of them advancing remarkable theories of pure mathematics. "Here it is. You're interested in fairy chess, aren't you?"

Wood stared. "Yes. Yes, I am. But—"

"I've got a reason for asking you. I'm not a chess player. Can you give me some idea of what fairy chess is?"

"Why . . . certainly. You understand this is merely a hobby of mine." DuBrose thought Wood blushed slightly as he reached for a pile of chessboards and laid them out on a table. "I don't quite know what you want, Mr. DuBrose—"

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"I want to know what fairy chess is. That about covers it."

Some of Wood's shyness was dissipated. "It's a variation of ordinary chess, that's all. About 1930 a number of players got interested in the possibilities offered. They felt there wasn't enough scope in orthodox chess, with its variation of problems—two-man moves and so on. So fairy chess was created."

"And—?"

"Here's a regulation board—eight squares by eight. Here are orthodox chessmen, king, queen, knight, bishop, castle, pawn. Knight moves two squares in one direction and one at right angles, or one and two. Castle in straight lines, bishop—diagonally in any direction on a single color. The idea, of course, is to checkmate. There've been a great many variations, but some themes are simply impossible on the regulation board, especially certain geometrical themes."

"You use a different board?"

"In fairy chess, you may have men of different powers and boards of different types. Modified space compositions—here's one." He showed DuBrose an oblong board, eight squares by four. "Here's another, nine by five; here's a larger one, sixteen by sixteen. And here are fairy chessmen." DuBrose stared at unfamiliar pieces. "The grasshopper. The nightrider—though that's merely an extension of knight's move. Here's the blocker, which can block but never capture. Here's an imitator."

"What does that do?"

"When any man moves, the imitator must move for the same number of squares in a parallel direction. It's rather difficult to explain unless you're familiar with chess principles, I'm afraid."

"Well—I gather it's chess, with a new set of rules."

"Variable rules," Wood said, and DuBrose leaned forward sharply. "You may invent your own men and assign them arbitrary powers. You may design your own boards. And you can have rule games."

"Meaning?"

"Here's one." Wood set up a few pieces. "Let's say, on this, that black never plays a longer move than his previous move. A one-rule game."

DuBrose studied the board. "Wait a moment. Doesn't that presuppose a certain arrangement of men?"

Wood smiled, pleased. "You might make a good player. Yes, you'd automatically have to assume that black's longest move it always available to begin with. Here's another. Black helps white mate in two moves. Oh, there are plenty of problems, the castling mutation, the camel-hopper, the actuated revolving center, checkless chess, the cylinder board—the variations are endless. You can have irreal men. The possibilities are endless."

"Assigning these arbitrary values—wouldn't that bother a man who'd been trained with orthodox chess?"

"There's been a minor war since 1930," Wood said. "The orthodox players, some of them, call fairy a bastard and unacceptable form. Still, we have enough fairy chess

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players to hold tournaments once in a while."

A thoroughly elastic mind . . . one that isn't bound too much by familiar values . . . a man who makes up rules of his own.

Jackpot!

But DuBrose kept his fingers crossed as he opened the portfolio.

Three hours later Eli Wood pushed his spectacles up on his forehead and laid down a curve-stemmed pipe. "It's fascinating," he said. "Most extraordinary thing I've ever encountered."

"But it's possible? You can accept—"

"I've been accepting ridiculous things all my life," Wood said. "I've seen some peculiar things." He didn't elucidate. "So your equation is founded on the variability of truths."

"It's far over my head. But—several sets of truth."

"Certainly. Several sets." Wood searched for his spectacles, found them, and pulled them down into place. He blinked at DuBrose through the lenses. "If mutually contradictory truths exist, that proves they're not contradictory—unless," he added mildly, "they are, of course. That's possible, too. It's simply fairy chess, applied to the macrocosm."

"If I remember right, part of the equation says that a free-falling body drops at the rate of five hundred feet a second. Later on the body is dropping at nine inches a second."

"Black never plays a longer move than his previous move. Remember? That's the rule in this part of the equation, I'd say."

"Presupposing a certain arrangement of men."

"Which would be the constant factor. I don't know what it is; this will take a great deal of study."

"You can nullify gravity, then—"

"Some themes are impossible on a regulation board. Set up the equivalent of a board in which the rule is—no gravity—and you've got it."

A macrocosmic board, one of the conditions of which is that the earth doesn't revolve. Within the limits of that board—*it doesn't.* Nevertheless it doesn't move. Galileo was wrong.

"Can you solve this equation?"

"I can try. It'll be a fascinating problem."

There was more to discuss, but finally DuBrose was satisfied. He left, having secured Wood's promise to consider the problem top priority. At the door DuBrose, troubled by doubt, turned.

"You're not—bothered—by the idea of variable truths?"

"My dear man," the mathematician said mildly. "In *this* world?" He chuckled, bowed, and let the door panel slide shut.

DuBrose went back to Low Chicago.

X.

Two visor calls were waiting. DuBrose turned on the playback attachment. The Secretary of War should have come first, but he listened to Nela Cameron instead.

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"Ben. I tried to get Seth, but he's out. I'm worried about Bob. He's gone to New York to see a Dr. Fielding. He's . . . I don't know. It's probably something at the office. Call me if there's anything I should know, will you? That's all."

Dr. Fielding. DuBrose knew him; a psychiatrist. Mm-m.

The Secretary of War said that there had been an inexcusable mistake. Dr. Emil Pastor had been located leaving Low Denver. He had been wounded—but not killed.

Result: that whole group of intercepter guards had disappeared. There was no trace of Pastor. He couldn't get far. Kalender had ordered double precautions. Pastor must be killed on sight without mercy.

Any suggestions?

DuBrose could think of none. Kalender had muffed the job. Anything could happen now.

He left messages and headed for Low Manhattan. No use calling Dr. Fielding. It might be better if Cameron had left before DuBrose arrived. That way, DuBrose might get some valuable information from the psychiatrist.

Very definitely, something was wrong with the chief.

Flying southeast, DuBrose thought of Eli Wood. Could the mathematician solve the equation? A man trained to the variables of fairy chess—well, the very fact that Wood had taken up fairy chess showed the elasticity of his mind. DuBrose remembered that Pastor had composed unorthodox stories of his own on the Fairyland gadgets. Why hadn't the War Office given Wood the equation already?

The answer was obvious. Only the top-flight men had been selected to solve the equation. Wood was competent enough, but his record lacked the brilliance necessary to impress the brass hats. And he didn't, after all, have one of the Bib Jobs.

Would the mathematician go mad, like the others?

No use putting all the eggs in one basket. There might be other technicians who played fairy chess—or the equivalent.

The copter roared toward the nearest Gateway to Low Manhattan. DuBrose tried to visualize Seth.

"Something's wrong with the chief."

"Has he got wind of what's going on, Ben?"

"I don't know. I wish you weren't dead. If I could only be sure what's the best thing to do—"

"You've got Eli Wood on the job. That's something. As for the chief, he may be the Civilian Director of Psychonamics, but he's got a colloid in his head. You're a psychotechnician. Get busy."

"I'll try. But I'm walking six tightropes at once—"

Only one God has ever died . . .
Only one God has let his side . . .
Be wounded by a soldier's spear!

What was that? Some old poet; he couldn't remember the name.

Trying to kill me! Trying to kill their God!

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He had acted instinctively. Self-preservation was almost a taxis. Coincidentally with the burning agony in his shoulder, he had used the power. They had vanished.

Now his left arm hung withered and useless. The pain throbbed in dizzying rhythms through his head and body. He kept walking. The stars glared, coldly and unapproachably, but he could quench them if he wanted. He could turn that blazing vault black for ever and ever.

Dr. Emil Pastor. Dr. Emil Pastor. Emil-dear. A name, a word, a spot of cool, friendly light in the raging turmoil—

But what was Dr. Emil Pastor? What was Emil-dear?

If he could find his way to that spot of light—

Where was it? There was only the dark here, and night winds, and grass that rustled under his feet. A tree loomed up before him. He destroyed it without thinking. Realization came back then. There was some reason why he mustn't use the power.

Good intentions. The other God had had good intentions, too. But they had tortured him, hated him. . . . What about the Deluge?

Emil-dear. That meant something. It meant peace and safety, words he had almost forgotten. He didn't want to be God, really. He hated being God. If he could get to the place where he had left Dr. Emil Pastor, he could slip out of that incarnation and find rest once more. But he didn't know where it was.

Colorado. He was somewhere in Colorado. But that told him nothing. Without transportation or communication, he was lost, even He.

The woman—

He was going to her. To find the Dr. Emil Pastor he had left with her. She could help him. He was going to her.

Nothing was going to stop him!

DuBrose met the Director of Psychometrics outside Dr. Fielding's office. Cameron's face was haggard, his gray hair rumpled, and his eyes had lost their steadiness. A nerve jumped in his cheek.

He said, "What do you want?"

"We got trouble," DuBrose said shortly.

"Nela told you I was here?"

"Right. She said you were going to see Fielding."

"Didn't you wonder why?"

"It's not unusual for our department to consult a psychiatrist sometimes," DuBrose said. "But you've been acting funny. So, since you ask—yeah, I wondered why."

Cameron's gaze flicked past DuBrose's shoulder. He gave a low exclamation, turned, and nodded for DuBrose to follow. As they walked, he said, "Was that Ridgeley?"

"Yes."

To DuBrose's surprise, the director exhaled with relief. "Not a hallucination, anyhow. I've been seeing him everywhere tonight . . . I've been on the run through Low Manhattan, trying to dodge him. Haven't seen Fielding yet. I don't know—"

DuBrose guided Cameron on to a

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Way. The courier, he saw, was still following, though at a distance.

"What's up?"

"I've been out in the Spaces," Cameron said dully. "Trying to dodge him. It's getting so I can't—" He paused. His questioning gaze probed DuBrose's. "Where's Seth?"

"I can't tell you, chief. I only wish I could. Why not trust me?"

"It's—Ridgeley. Why should he be following me? I've spoken to guards twice. Each time, when they looked for Ridgeley, he was gone."

DuBrose said, "I asked the Secretary of War to check on him. We think he's in Falangist pay."

"A Falangist?"

"No-no. But in their pay."

"Assassination doesn't worry me too much," Cameron said. "It's this other—" Again he stopped. DuBrose glanced at an overhead marker and urged the director to a crosstown Way. Low Manhattan was crowded, even at this late hour. On a full-time production schedule, even the graveyard shift roared.

"Ben. Are you trying to dodge Ridgeley?"

"I know a place where we can get away from him. I hope."

Blue Heaven was mildly notorious. At its garish portals DuBrose took out a blue key and used it as a passport, while Cameron frankly stared. "I didn't know you went in for these diversions," he said.

"Seth gave me this key," DuBrose explained. "He thought I needed an emotional catharsis. Ever been here?"

"No. Seth's told me about it. Rather—high powered, I gather. But—" He peered along the Way. There was no sign of the courier.

DuBrose said, "He can't walk through walls. It'd take him a while to get hold of one of these keys, and I don't know for sure that he can." They went along a mirrored hall through pale clouds that glowed faintly. Some energizing radiation pulsed through the dim air. An attendant appeared.

"Your pleasure? What type of enjoyment would you prefer? We have a new pattern for Creepies—"

"That'll do," DuBrose said. "Where is it?"

Clouds billowed up and surrounded them; they were conscious of smooth motion through that warm opacity. They were relaxed upon padded cushions before they quite realized that the movement had stopped. The soft voice of the attendant said, "The clouds will thicken a little. We don't bother with awkward neural attachments here. The water vapor is the conductor."

"Wait a minute," DuBrose said. "Suppose we want to take a break? How do we turn off the program?"

"This lever, at your right hand. Now—"

The clouds thickened. DuBrose was not sure the attendant had gone. He waited. The first tingling vibrations of a Creepy neuropattern began to whisper through him. He felt drowsy, comfortable, infinitely relaxed. Images moved slowly through his mind.

Greek theaters had been one of

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the early forms of audience-projection. Later the cinema had expanded the scope, and television. All these art-forms had been aimed at making the receptor identify himself with the artist—and the Creepies, with their delicate patterns of pure sensory impressions, were the current development. DuBrose had felt Creepies before—you didn't see them—and knew they were excellent in entertainment-value. But this semibootlegged stuff was different.

It was rough!

Shock—shock—*slam!* Through the drowsy inertia the racing sensory currents plunged into DuBrose's brain, with a violence that sent adrenalin pumping into his blood. Fear, hatred, passion—these emotions and others, stepped up abnormally, mingled in a cacaphonic symphony that jolted him horribly. His hand twisted the lever. Instantly the nerve-racking violence stopped, but he was sweating.

The fogs faded. Beside him, Cameron grinned faintly.

"Better than a Turkish bath," he said. "But leave it off. I want to be able to see if Ridgeley shows up."

DuBrose took a few deep breaths. "Any idea why he's chasing you?"

"I might have. But do you?"

"I told you. He's probably in Falangist pay. Why don't you tell me the real trouble, chief?"

"I can't. Not yet. Unless . . . answer a question for me. Has anything turned up that might make me . . . indispensable?"

DuBrose thought that over. He was a psychotechnician; he could see how close Cameron was to the verge. If he could take the risk now, it might solve a good many problems.

"Well—answer a question for me first." He'd chance it—with his fingers crossed. "Remember that hypothetical equation we were talking about yesterday?"

"The truth-variable? I remember."

"Could a guy who plays fairy chess solve that equation? Or would he go insane?"

Cameron sensed the significance of the query. His eyes narrowed. But he took a long time to answer.

"He could solve it. If anybody could, I imagine."

DuBrose swallowed. "And . . . if he couldn't . . . you'd still have enough dope to find somebody else who could, I suppose. I . . . I'll answer your question, chief. I don't want to. But I'm afraid. I'm afraid of what's happening to you. You're screwed up, and you won't tell me what it is, and I'm betting it's tied up with—this business."

"Ridgeley?"

"He's part of it. Seth and I couldn't tell you before because we were afraid the responsibility would—have bad results. But you know the answer now."

"What answer?"

"That equation isn't hypothetical," DuBrose said. "The Falangists have got it and have solved it. They're using it against us. We've got it, but we haven't been able to solve the thing. Our technicians have been going nuts. It's been

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your job to find a type of mind that could solve the equation."

Cameron hadn't moved. "Keep talking."

"Seth and I had to keep the knowledge of that responsibilty from you. You understand why now, don't you, chief?"

The director nodded slowly. But he didn't speak.

"We had to present the problem to you as theoretical. We were afraid you'd catch on. But I saw that fairy chess man tonight, and he's certain he can work out the equation. Even if he can't, we know, now, the type of man who can handle truth-variables. It's a matter of selection. If you fail, it's because the right man can't be found. But that won't be your fault. You know what sort of mind to look for."

"It's close to casuistry," Cameron said. "But it's sound logic. Only I don't know enough about the set-up. Tell me. Where's Seth?"

"Dead."

Silence. Then—

"Start at the beginning. Let's have it, Ben. And fast."

Nearly an hour later Cameron said, "If I'd known this from the beginning, I wouldn't have had my own trouble. But if you'd told me the set-up, the responsibility would probably have driven me insane. Listen." He told DuBrose about the rippling mirror, the soft doorknob, the mobile spoon, the shifting floor. "All aimed at my sense of security, you see. Trying to make me incapable of decisions. Building up an anxiety neurosis—to say the least. I knew it was impossible, except through science we haven't attained yet. But—"

DuBrose's throat was dry. "Lord! If you'd told us!"

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"I didn't dare. I was mixed up at first. I thought it was all objective and tried to find explanations. There weren't any. There were two possible answers. I was going insane. Or I was the victim of a planned campaign. In the latter case, there was some motive—I didn't know what. But I guessed that it was to drive me insane by artificial means. I decided to string along. I knew there might be scanning rays on me. Any word I said might be picked up by—the Falangists, or whoever was attacking me."

Cameron sighed. "It wasn't easy. I decided I could learn more by pretending to believe the manifestations were subjective. That way, the enemy might discount me, and I might find out what they were after. I knew you and Seth were up to something, and I guessed it was connected with this business—my hallucinations—but I trusted Seth. More than I trusted you, Ben. Till now."

DuBrose said, "You've been playing along, then—"

"It sounds easy, doesn't it? But a man can never be sure whether or not he's going insane. I haven't been sure. My mind . . . well, I've been in a genuine psychotic state, artificially induced. They succeeded in that. Tonight I had to have some help. I had sense enough not to tip my hand by seeing you or . . . Seth. I thought if I talked to a psychiatrist, I could get the value of catharsis, anyhow, without giving away what I suspected. But now it doesn't matter. Even if there's a scanner on me now—the Falangists can't make use of any information they gather. Because they can't stop us."

"Don't underestimate them," DuBrose said. "They've solved the equation. They can use it as a weapon. They know how to make bombs that can penetrate our force-shields, for one thing. And I'll bet that isn't all."

Cameron closed his eyes. "Let's see. First, the equation must be solved. That'll put us on even terms with the Falangists. Second, a counterequation must be solved. But I don't know if even a fairy chess player could work that out."

DuBrose blinked. He hadn't foreseen this possibility. It was an entirely new and unexpected responsibility—the need for finding a man who could not only solve the equation, but nullify its effect.

"Eli Wood's a fine mathematician—"

"Of this era. He can break down the equation; I'm willing to accept that. It's easier to analyze than to create. Ben, don't you realize yet where that equation must have come from?"

"The Falangists—"

"Are contemporaries. Their science is no more advanced than ours. And the equation is the product of another type of technology entirely. Ridgeley's the answer.

"He's responsible?"

"If he's from the future, it's probable that he brought that equation with him. And gave it, or sold it, to the Falangists. You were right in thinking one key to all this

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is Ridgeley. I want to try my hand at hypnotizing that mutant of yours . . . what's his name? Billy Van Ness? We may be able to learn something valuable."

"Ridgeley seems to me the most dangerous opponent we've got."

"He may be the most valuable," Cameron said thoughtfully. "I've an idea— Mm-m. You asked Kalender to put a scanner on Ridgeley?"

"I don't know if he's managed it yet. You've got to locate the subject before you can adjust the scanning ray."

"All right," Cameron said. He got up. "We've work to do. But I feel better. I . . . *know* now, that I'm not going insane, or going to be driven insane. For a while I was beginning to feel like a medieval peasant, attributing everything to my personal gods and devils. Now—"

He turned toward an arched opening visible through the thinning mists. "Now we'll find a visor—fast. Then we'll start integrating. Come on, Ben. You'll have to be ready to take over for me—in case."

"But you're all right now, chief. You know what the Falangists were trying to do to you."

"I know," Cameron said coldly. "But you've forgotten one thing. Even now, they could succeed. They could drive me insane through sheer pressure. They can use that equation on me till my mind cracks and retreats into insanity as an automatic defense measure."

"It's still happening?"

"Centipedes," Cameron said. "Little bugs. Spiders. If I took my tunic off and looked, I wouldn't see them, so there's no way of knowing what they are. But they're crawling all over me, and insanity would be a relief, Ben."

He shivered.

XI.

At a public visor they called Kalender. The Secretary of War wasn't at GHQ, but it didn't take long to get the beam relayed.

The strong, harsh face showed strain and annoyance. "So you've finally decided to talk to me, eh? I appreciate it, Mr. Cameron."

"Mr. DuBrose was acting under my instructions," Cameron said briefly. He didn't want to quarrel now. "It was important that I be kept incommunicado while I worked on a certain matter. The slightest distraction might have been fatal."

"Fatal?"

"Yes. What's the latest on Dr. Pastor? DuBrose has kept me posted on current stuff."

"Have you solved the equation? Or found anyone who can?"

"Not yet," Cameron said. "I'm doing my best. But what about Pastor?"

"Oh . . . well, nothing. We've a dragnet out. Your man DuBrose thought he might head for his home. We've a cordon there. Enough camouflaged equipment to blast him into electrons. Or quanta. We haven't told his wife anything. If he shows up—"

"He's left no trail?"

"Of . . . obliteration, you mean?

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No. I doubt if he's using the power."

"You're doing all you can," Cameron said. "Now what about Daniel Ridgeley?"

Kalender said, "It's ridiculous. The man's invaluable to us. DuBrose must be wrong."

"Did you check his case history?"

"Naturally. And it checks."

"Could it have been faked?"

"Not easily."

"But it could have been, eh?"

"He can't be a Falangist," the Secretary of War snapped. "If you knew the valuable enemy information his espionage work has given us—"

"A lot of good that will do you now," Cameron said. "The equation can simply wipe us out, and you know it. Have you put a scanner on Ridgeley?"

"Haven't been able to locate him. I called him on his private wave length, but he's turned off his receiver."

The director didn't comment on that. "He's in Low Manhattan. Put a scanner on me. Here's the visor number where I am now. I think Ridgeley may try to get in touch with me; if he does, scan him. And don't lose him! Better put three or four beams on the man."

DuBrose whispered something; Cameron nodded. "Ben DuBrose is with me. Scan him, too. We can't miss a bet on picking up Ridgeley."

Kalender said, "Do you want shadows?"

"No guards, no." Cameron thought for a moment. "All I want is to have Ridgeley under close supervision. But don't restrict his movement. That's important. I've got an idea."

"You're scanned," the Secretary said, after nodding to someone offscreen. "Both of you. Anything else?"

"Not now. Luck."

"Luck."

DuBrose said, "You told him we hadn't found anybody to solve the equation."

"Well, the beam might have been tapped. We don't want Wood murdered. I'm probably scanned already by Falangists. Otherwise they wouldn't have been able to direct their mumbo-jumbo so accurately. It never happens when anyone else could notice."

"They're still . . . working on you?"

"Yeah," Cameron said. "Well, I'll call Nela. Then—"

He did.

"Then what, chief?"

"Seth had an apartment not far from Low Manhattan. I want to see if he left anything."

"What about Ridgeley?"

Cameron met DuBrose's eyes and grinned. What about Ridgeley? The courier was almost as much of an unknown quantity as the equation itself.

They found a pneumocar.

Seth Pell's "apartment" was really a cottage, a unit affair aimed at convenience amounting practically to hedonism. Cameron had the key-combination. The tinted fluorescents went on automatically as

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they entered, and the aerothermo-adjusters began to murmur softly. DuBrose looked around the big, pleasant living room. He had never been here before.

"Seth used this as a hideout," Cameron said. "Here." He went to a night battle scene on the wall. As he approached, rhythmic motion rippled across the panel. The white streaks of rockets flared up, two by two; the pulsing of scarlet-tinged smoke clouds throbbed gently. Cameron watched the scene, waited briefly, and whistled a few bars. The wall opened.

Cameron took out two vibropistols, handed DuBrose one, and walked to the other end of the room. "It's not a duel," he said. "Let's say it's a trap. Just in case. Ridgeley would catch up with us sometime, and this is the first time we've been away from crowds since I got to Low Manhattan. Stay the room's length away from me."

DuBrose nodded. He balanced the pistol. He had never fired one in his life, but that wouldn't matter. Aim and press. That was all. He glanced at the doors.

Cameron had opened another panel, and then a safe behind it. Finally he switched off a force-shield. "Nothing, I guess," he said, hunting through papers. "I didn't expect to find much here. Seth seldom brought work to this hideout."

DuBrose studied the room. It was a unit, well furnished, with none of the bad taste that had marked Pastor's magpie eyrie. Thousands of books filled the shelves, both ancient and modern; and there were cases of ribbon-volumes, recorded on wire tape. A pillow on a low relaxer still held the impress of Pell's head.

"Seth told me once that he was a misogynist," DuBrose said.

Cameron nodded. "I suppose he was. He didn't make many friends. You had to earn his friendship. You'd think he'd have been an antisocial type. But he wasn't; he adjusted surprisingly."

"He liked his work."

"Seth would have adjusted to any kind of work. He was—" Cameron pulled out a book, examined it, and thrust it back. "He had a theory that wars were inevitable. He said they were extensions of the individual life pattern. Most people go through a series of personal wars, emotional, economic, and so on. A maturing influence, if they survive. Perhaps not strictly necessary, but Seth thought inevitable, according to the general pattern of existence. Survival of the species and self-preservation—the main factors. Reflected, *in petto*, by individual wars and by national ones."

"That sounds like a morbid philosophy."

"Not if you don't expect happy endings. Ben, when this war with the Falangists is over, that won't bring the millennium. Seth would have said that each war is a hammer blow forging a sword into shape. Tempering it. It works that way on the individual, when the sword isn't spoiled or broken. Perhaps it works that way with the race. A people who'd always lived in Utopia wouldn't have much survival value. Your gun, Ben."

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DuBrose didn't have to elevate the muzzle more than an inch. He kept it aimed steadily at the sturdy, bronze-haired figure standing by the door. Ridgeley's brown-and-black uniform was spotless; the lapel insignia gleamed under the tinted fluorescents.

DuBrose studied the man. Neckless, compact, very strongly muscled, but built for speed as well as strength. There was nothing to mark the courier as an envoy from another time-period. Unless that glowing exultation deep in the black eyes meant anything.

Ridgeley held no weapon, but DuBrose remembered the cryptic, glittering gadget the courier had once aimed at him.

Cameron said quietly, "I don't know your potentialities Ridgeley. You might be able to kill both of us before we could kill you. But you're in danger of cross-fire. You're between DuBrose and me."

Ridgeley's face was impassive. "Why, you might kill me," he said pleasantly. "I admit that possibility. But I like taking risks."

"You intend to murder us?"

"I'll try to, anyhow," the courier said. DuBrose moved his pistol a little. Ridgeley wasn't infallible. By this time the scanner was focused on him. Did he know that? In any case, he himself had admitted that these odds might be too heavy.

A man from the future wasn't necessarily a superman. He had his own limitations.

"I've an ace up my sleeve," Cameron said. "So don't begin till we've finished talking. I think I can make you change your mind."

"Do you think so?"

"First—what about trading information?"

"There's no necessity."

"Will you tell me what you want?"

Ridgeley didn't answer, but the quizzical mockery darkened behind his eyes.

DuBrose watched the courier with one eye and Cameron with the other, trying to anticipate a signal. None came. He could feel perspiration trickling along his ribs.

"DuBrose and I both want to stay alive," Cameron said. "So do you. This particular combat can come now or later. Is that right?"

"Why not now?"

"Because it may not solve anything. Do you know what happened to Dr. Pastor?"

"No," Ridgeley said. "I've been out of touch lately. I thought it wiser. Pastor—wasn't he working on the equation?"

Yes—the courier had his limitations. DuBrose watched, trying to find some clue behind those impassive features, while Cameron explained what had happened to Pastor.

"So that's the immediate danger," he finished. "We might kill you, you might kill one or both of us, or both. Pastor's still free, somewhere. Do you see the latent trouble?"

Ridgeley apparently had already made his decision. "Pastor must be killed. The Secretary of War might fail. In that case . . . yes, he's the immediate problem, Cameron.

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There'd be little satisfaction in killing you if Pastor destroyed the world afterward."

"Hold on," DuBrose said. "Don't you *know* whether or not Pastor used his power—is going to use it—that way? Unless time's a variable—"

"I don't know," Ridgeley said. "So I can't take chances. I'll see you later."

He backed out of the room. DuBrose moved forward and closed the door. The window ports were one-way, so privacy was insured.

"We're letting him go, chief?"

Cameron was rubbing his forehead. "We'd better. He might do the job for us—get rid of Pastor. And that *must* be done. A gun battle now wouldn't have meant a final decision. Ben—he said he didn't know."

"What? Oh. That was odd. If he's really from the future, if he's mastered temporal travel—he ought to know."

"Yes, he should. At least he should know whether or not time's inflexible or whether there are temporal probability lines. Mm-m. Let's try Kalender."

Kalender said there were now five scanning rays impinging on Daniel Ridgeley, and that the courier was heading by copter northwest. Also a technician, studying the equation, had suddenly giggled, shrunk to nothingness, and vanished. Microscopic examination revealed nothing but a pinpoint hole in the floor. Presumably the technician had dropped clear to the center of gravity.

There had been three more cases of straight insanity as well.

Cameron switched off the beam and nodded at DuBrose. "Try Eli Wood. See how he's getting on. Perhaps I'd better stay out of range." The director listened closely from his vantage point.

Wood's mild face was ink-stained, but his placidity seemed unruffled. "Oh, Mr. DuBrose. I'm glad to see you. I thought of trying to reach you at Psychometrics, and then—well, you said this was highly confidential."

"It is. How're you doing?"

"Nicely," Wood said. "It's fascinating work. But it's much more complicated than I expected. Sometimes it's necessary to work on two or three problems simultaneously, in view of the temporal variation. If I could have access to some integrators—"

"Head for Low Chicago," DuBrose said, in response to a nod from Cameron. "We'll authorize you to use the Integrators. You can have a staff—"

"Fine. I'll need men, too—trained men."

DuBrose hesitated. "Won't that be dangerous? For them, I mean?"

"I don't think so. I simply want certain problems solved fast. I'll give them the material to work on. And I'll want some mechanics. There are a few changes I'd like to make in an Integrator. I've worked out the method, but I don't know how to rig wires."

"O.K. Any idea when you'll be finished?"

"I can't tell yet."

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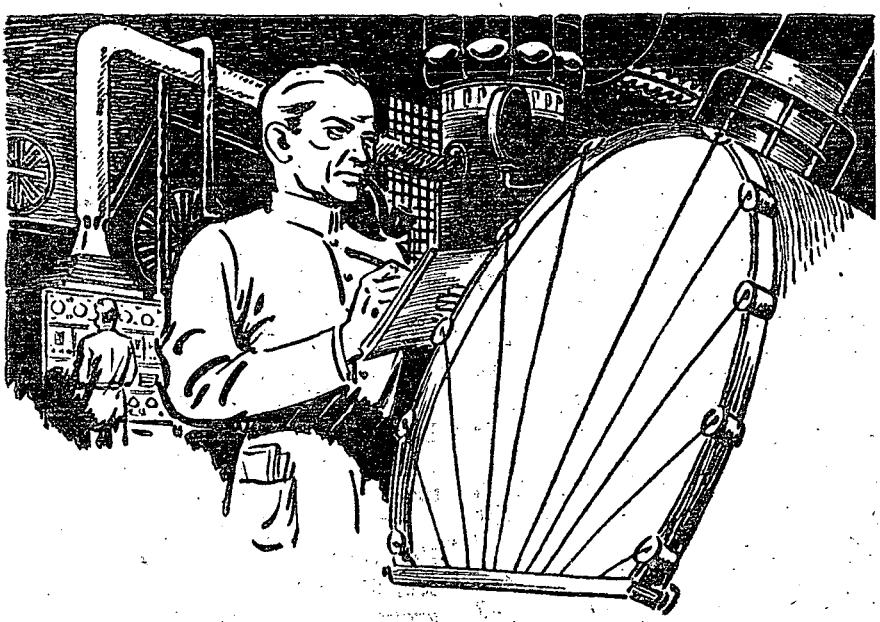

"Well—go ahead."

"Oh—one more thing, Mr. DuBrose. I've never been to the Integrator rooms. Will it be all right if I smoke there? I can't work very well without my pipe."

"It'll be all right," DuBrose said, and watched Wood's calm face fade away. Cameron chuckled.

"He's the right type, I think."

"What about those helpers he wants?"

"They won't go insane. It isn't their responsibility. They delegate that to Wood. Well, let's head for Low Chicago ourselves. I want to see that mutant boy—Van Ness? If we can get some information about Ridgeley out of him, that'll help."

"It won't be easy. He's badly disoriented."

"I know," Cameron said. "But we've got to fight Ridgeley some time. I'd just like to know why—that's all!"

DuBrose nodded, thinking that if the courier's motivation could be discovered, a good many problems would be automatically solved. However, matters seemed to be approaching a climax. From now on, these final steps would, at least, be extraordinarily interesting. It would certainly be exciting—

But it wasn't. It was routine.

XII.

Wars are not won by battles. Before the battle must come gruelling, intensive preparation, in which every contingency must be planned and charted. In this particular case the unknown quantities had to be found, and there were many of them. Item: Who was Ridgeley?

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What did he want? What powers did he possess?

"We can't find out through his War Department record," Cameron said, studying graphed psych-lines. "He'd built up an assumed personality for that role. We've got to study his environment, his actions and reactions—and Billy's very useful on that score."

DuBrose watched the mutant, sleeping quietly under hypnosis, an encephalogram charting his brain-waves. "We've found that temporal anchor, anyway."

It was merely a sea anchor so far, with guided hypnosis to aid. The radiation-pattern of Van Ness' brain had showed distinctive variations under certain stimuli. By leading the mutant to concentrate his EPT upon the time-sector they wanted, by checking, on the chart, the stimuli that distracted him or, conversely, helped him to focus, it had been possible to learn something of Ridgeley's past—in the future. But it was always necessary to allow for a margin of error, due to Van Ness' confusion over duration. Thus there were blanks and snarls in the story; some of these could be straightened out by applying the yardstick of familiar experience, but when that failed, the unknown x had to be supplied.

It took days.

Meanwhile nothing had been heard from Dr. Pastor. Cameron had finally decided to use guards. Low Chicago was on alert. Only the most necessary warmen were allowed into the cavern that teemed with guards and specialized technicians. In the Integrator rooms, Eli Wood and his staff of co-ordinators worked at top speed, though the mathematician did not seem to be affected by the tension. Puffing thoughtfully at his pipe, he wandered through the forest of huge semicolloid mechanical brains, making notes on his cuff when he couldn't find a pad, and occasionally discussing his progress with Cameron and DuBrose.

"Won't we need machines?" DuBrose had asked once. "To utilize the equation once we crack it, I mean? Some sort of transmitter—"

"Probably," Wood said. "Though I'm not sure even of that. You see, this thing is working out as a group of variable truths, so *very* variable that we can't anticipate what we'll need to harness it. That mental case of yours—he used mental energy, and he neutralized gravitation. I might find one basic, arbitrary truth that would presuppose the transmission of controlled variable-truths through the medium of a lead pencil or a block of iron. Or a hair follicle," he added, blinking mildly.

"But you're getting it?"

"Why sure. However, the counterequation is 'way beyond me. I *might* crack that too, but it would take months."

"Can we wait months?" DuBrose said, and answered his own question. "No. We've a chance now to smash the Falangists. Their chief weapon is controlled use of the equation. More of those bombs of theirs have penetrated our shields.

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If they launched an all-out invasion now—"

"Their robots might win," Cameron broke in. He stared at the huge Integrator pulsing softly in the distance. "That was their plan. The bombs were nothing. They were aiming at the technicians."

Wood said, "There can't be more than a hundred top men in this country. Electrophysicists, electronic engineers—and so on. Men who are trained to think up fast countermoves—"

"It's a technological war," Cameron agreed. "Once they drove our best technicians insane, we'd be as helpless as the blood-stream without a liver. In a position where we needed new ideas fast—we'd go down. Because the men who could supply those ideas would be insane."

"Even when we crack the equation, though," DuBrose said, "it'll be deadlock."

"Yeah— We'll be on even terms with the Falangists again." Cameron moistened his lips; without a counterequation, there would be no help for him. The psychic assault had not halted. An hour ago, in his office, he had watched a lighted cigarette crawl out from between his fingers and loop up his forearm like an inchworm, burning his skin as it moved.

DuBrose was watching the director. "We'll manage it," he said. "Somehow. There's got to be a way. We've enough resources—"

Cameron nodded. "I finally got Kalender to stop all research on the equation. All but yours, Wood. So that'll save some technicians—but the top ones are either dead or insane already."

DuBrose said, "We can't get back the dead ones, but we can cure the others. Just show them the solution to the equation."

"Not quite as easy as that, Ben—but that's the cure. They went insane because they couldn't shoulder their responsibility. If we can make 'em realize there *is* no more responsibility along that line, they should snap out of it fast."

"Well, I've got to get back to work," Wood said, rekindling his pipe. "All this, you know, is a form of fairy chess in which the rules aren't clearly stated." He blinked at the great Integrator. "Amazing things. I don't understand—" He went off, shaking his head thoughtfully.

"He'll crack it," DuBrose said confidently.

"Yeah. When? Let's look up Billy." Flanked by guards, they returned to the psychometrics sanatorium and another session with the mutant. Bit by bit, more notes were being added to the file on Daniel Ridgeley.

Van Ness could be no more than a spectator. He saw duration, but he was a psychotic case himself, and had the reactions, though not the vocabulary, of a child. He would answer questions and tell what he saw, but no more than that. And, while he had learned to identify Ridgeley easily because the courier's protracted duration-line was perceptible to him, a chronological

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charting was obviously impossible. He skipped; in one sentence, Ridgeley would be seen as an infant, in another an adolescent, in a third, a mature adult, and in a fourth, an invisible something suspended in what must have been a pre-birth incubator, though it seemed extraordinarily complicated.

And very slowly, very faintly, the picture of Ridgeley's own world began to swim out of the clouded vistas of time.

It took shape. Like a land seen from above, fog-shielded, peaks and rises gradually emerged from that misty dimness. It was possible to assign a tentative chronology, too, by making Van Ness describe Ridgeley's appearance thoroughly. Lines of experience appear and deepen on a man's face as he grows older.

Routine. Tedium. Anxiety, as the days dragged past and the *status quo* held. Dr. Emil Pastor stayed invisible. Cameron's hallucinations continued, till he allowed DuBrose to dope him whenever that drastic step was necessary. The insane technicians stayed insane. M-204, in his sanatorium, was still Mohammed and remained afloat a few feet above his bed, ignoring the undignified force-feedings as he passively ignored everything else.

Unofficially, GHQ moved to Low Chicago. A concentration of equipment and men began to flow into the cavern city. No one knew what might be necessary, but everything was made as available as was possible.

Ridgeley, they learned from the scanners focused on the courier, was moving through the country, sometimes by copter, sometimes afoot, using something resembling a directional compass. He was obviously trying to locate Dr. Pastor. When he did, GHQ would know it.

Cameron came in one day nervously excited. DuBrose looked up from the papers on his desk, automatically expecting trouble.

"Anything wrong?"

"Found Pastor yet? No? Well, listen in on this. I've got an idea." He used DuBrose's visor to get Eli Wood. The mathematician, as quietly imperturbable as ever, nodded at them from the screen.

"Morning. We're coming along nicely. I just found out that people ain't. According to that particular truth, it's quite accurate. We're reaching the end, incidentally."

"And you're still O.K.? But I can see that you are. Listen, Wood—check with me. How does this sound? We're assuming that Ridgeley brought the equation with him when he hopped back through time. He gave it to the Falangists. Well, the mutant Van Ness is giving us some of Ridgeley's background, and he comes from a remarkably advanced world—technologically speaking. The equation is used there. I can't pump out too much from Van Ness, but I gather it's a war weapon—not *the* one, just one of 'em. Wouldn't the counter-equation, the nullifying factor, have been known to Ridgeley's contemporaries?"

Wood pursed his lips. "Seems

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like it would. Can't you get that through your mutant?"

"He's a superficial observer. Even if he saw the counterequation used, he couldn't describe the set-up clearly enough. He'd miss too much. Besides, we can't guide him easily—and if we could, we wouldn't know what to look for. But assuming that Ridgeley knows the answer to the equation and how to handle it, can't we also assume he knows the counterequation?"

"Seems like. You've got scanners on him."

"That," Cameron said, "is what I mean. He's looking for Pastor. And Pastor's got that obliterative power that's part of the equation. Ridgeley must know how to protect himself against Pastor."

"The only protection would be the counterequation."

"If he uses it against Pastor—"

"The application," Wood said thoughtfully, staring at his pipe bowl. "I see. If he should do that, we could break down whatever he does into the counterequation. If a scientifically trained observer sees a gun go off for the first time, he should be able—theoretically, anyway—to work out a formula for gunpowder. Huh. I'd suggest cameras equipped for quantitative and qualitative analysis; keep them focused on Ridgeley through the scanners. Attach ultraviolet, infrared and any other stuff you can think of. That'll do to start. If Ridgeley does use some application of the counterequation against Dr. Pastor, we can crack that problem, too."

As Wood checkered out, Cameron turned to DuBrose. For the first time in weeks, the chief's eyes lost their tight fixity.

"You know what it would mean?" he asked softly.

"Yes," DuBrose said. "You wouldn't be . . . haunted . . . any more."

Cameron shrugged. "Natural for me to think of the personal application first. But it would also mean we could smash the Falangists. They don't have the counterequation. Because Ridgeley wouldn't have given it to them. The counterequation is his own life insurance. In his position, he's automatically a target for assassination—because the Falangists can't trust him."

"Wouldn't he be too valuable to them?"

"More dangerous than valuable. He gave them a weapon that could win the war, in exchange for . . . something. I don't know what. But if they should win, what use would they have for Ridgeley? And suppose Ridgeley sold out to us? A mercenary will change sides if it's profitable enough. The Falangists may be afraid of Ridgeley, they may find him tremendously useful, but they can't possibly trust him. He could win the war for either side, from the Falangist point of view. So Ridgeley would know enough not to trust his allies, and he wouldn't sell 'em his armor as well as his weapon."

"Sounds sensible," DuBrose admitted. "But suppose he doesn't find Pastor?"

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"Mm-m. Cheerful, aren't you? Let's try Billy again."

The pattern emerged.

There had been war in Ridgeley's time, too. But an absolute war. One that was served by the mightiest technological system the planet had ever seen.

It had gone on for a long time. It had sealed its impress into every part of the socio-economic system. Before birth, the sensitive germplasm was impregnated with radiations that would permit the later development of certain necessary talents. Ridgeley's people were warriors in bone, sinew, nerve, and brain. Psychologically they were beautifully equipped for their job.

And, in that time, there was but one job. War.

Exquisite muscular co-ordination blended with a super-fine neural structure. Ridgeley had whiplash responses. He could make split-second decisions. He was the embodiment of Mars.

He had been trained to fight and conquer, with all the tremendous facilities of his time-era. To fight and win.

But only that.

In Cameron's office—

"You started the wheels going around in my head," Wood said, "when you suggested that Ridgeley wouldn't trust his Falangist allies. He wouldn't give them the counter-equation. But the big point—the one that was holding me up—is something else. There's been a certain screwiness to the equation itself."

"The whole thing's screwy," DuBrose said. "That's the basic idea, isn't it?"

Wood blinked. "Nevertheless I was assuming the gambits were all there. Until yesterday. Has it occurred to either of you that the Falangists aren't making full use of their weapon?"

Cameron said slowly. "Our technicians are going insane—"

"A few factors of variable logic have been used. All that *can* be used by application of the incomplete equation."

"Incomplete!" DuBrose said.

Wood tapped ashes from his pipe. "It is. It's beautifully disguised, camouflaged so that it *almost* seems like a complete equation, but there's a factor missing. I didn't realize that till I realized the possibility of its absence. A jig-saw puzzle with a piece missing. If you know that, if you fit the rest together, you can see the shape of the missing piece. In its present incomplete form the equation's applications are limited."

"But why?" Cameron asked.

DuBrose said, "By God, I know the answer to that! The complete equation must be dangerous to Ridgeley! It could be used against him! Naturally he wouldn't trust *that* to the Falangists, or to anyone."

The Director studied his hands. "We've been assuming that the Falangists have the . . . the complete weapon. Whereas you say they probably have the bomb but not the bomb-sight. Eh?"

Wood nodded. Cameron went on:

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"Well . . . the Falangists aren't fools. They have good technicians. They'd have discovered that the equation isn't complete."

Wood nodded again. "They've had time enough."

"But they haven't found the missing factor, or they'd have used it against us in an all-out attack. I'm assuming that the completed equation, in practical application, would be rather invincible."

"Can't be sure. I'd say it might be. Except, of course, against the counterequation."

Cameron smiled. "Then the Falangist technicians would be working on the problem, too. They'd have an occupational illness too. They'd *have* to get the missing factor, for fear we might get it first, and for fear of Ridgeley. I wonder how many top Falangist technicians are insane by now?"

DuBrose said excitedly, "It's a two-edged sword. It must be. If Ridgeley—"

The Director grunted. "Can you find that missing factor?"

"I think so."

"Then why couldn't the Falangists?"

"A racial psychological handicap, perhaps," DuBrose suggested. "They've always been reactionaries. Their culture as a unit is fairly new, but it's based on very old, established lines. They—"

"They don't play fairy chess," Wood said. "Oh, it's possible they might get the answer, but they couldn't have done it yet, or we'd be smashed. That's how powerful the complete equation can be. Here's another point." He chuckled. "If I should fail, I know I won't be shot or have to commit honor-suicide. The Falangists have a strict, arbitrary code of ethics. They serve the State, but they worship it too. Failure to them is unthinkable."

Cameron seemed to agree. "The Danes conquered the Saxons plenty of times, but Alfred and his men kept coming back. When the Danes were defeated at Ethandune, they were psychologically broken as well. The Falangist culture is inflexible. It had to be, in the beginning, or it would have broken up. But now . . . yeah, our technicians worry if they can't solve the equation; and they go insane. But a Falangist technician would be conditioned to worry a lot more. Cultural handicap."

Wood said mildly, "I'm having fun. I just don't have time to worry. So I may crack the equation, missing factor and all, quite soon."

Cameron looked at him. "We can win the war. We've the chance to do so. But if we do, I'll always wonder why Ridgeley joined the losing side?"

"He wouldn't," DuBrose said, "if he knew. So he couldn't have known. Maybe no records survived to his time-period. There'd be only a vague legend that there *was* a war about now. But the legend might not say who won. Even if there were records, they might be so incomplete that—"

"Incomplete or incorrect," Cameron said. "Then there's another possibility. Alternative time-lines.

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In Ridgeley's original past, the Falangists might have won. But by coming back in time, he changed the set-up and switched the historical line across to an alternative future."

The mathemetician got up. "I must get back to work. Now that the matter is clarified somewhat, perhaps—"

Cameron didn't hear from him, then, for three days.

In the cool of the evening God, nee Emil Pastor, walked through the wheat fields of Dakota. A small, slight figure, he trudged on, while the silvery ocean of wheat rippled softly around him in the moonlight. He was following his shadow.

The shadow is the reality; the reality, shadow. Under his feet the hollow earth boomed deeply, and the sound crashed again and again into his aching head. He hated to stop. There had been enough delay. The sooner he reached his goal, the sooner his questions would be answered.

God should be omnipotent. That was the trouble. He was a dual personality. He had a dim, uneasy feeling that he might be not only God, but Apollyon. He might not be God at all. He might be merely the demon of destruction.

Why hadn't he been able to heal his own arm?

The neural tissues had been burned out. The pain he felt in that arm was imaginary, a familiar phenomenon in amputation cases. He had bound the withered member

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to his body; the loose swinging distracted him.

Physician, heal thyself. God, heal Thyself. Apollyon—

He was very, very puzzled as he slowed to a halt and stood silent in the great quiet wheat field, staring at his black, one-armed shadow. But far away and dimly he could still remember something called Emil-dear, and that meant safety, and his shadow would take him to that sanctuary.

There he could learn his name. God or Apollyon. That would tell him his destiny. God must rule with justice and forbearance. Apollyon must destroy.

Something was moving in the wheat.

No—it was the wind.

He willed the pain to stop, but it did not stop.

Slow, helpless, easy tears spilled down his cheeks, and he did not see the movement coming quietly through the wheat, under the white, relentless moonlight.

The iconoclast slipped noiselessly toward God.

"What about the application?"

"Simple enough. It's like this, Mr. Cameron. You can't play fairy chess unless you've got a board, the pieces, and unless you know the rules. Now we've cracked the equation, we know the rules."

"The board, though? And the pieces?"

"All around us. Matter, light, sound—things you wouldn't ordinarily think of as . . . uh . . . machinery. Ordinarily they're not. In orthodox chess you can't use a nightrider or a grasshopper. In orthodox logic you can't use a . . . a cigarette as a machine. But even a cigarette can be assigned arbitrary powers when you assume variable truths. This space-time continuum and its properties are the board and the men. By working on certain irreal space-time assumptions, you alter the shape of the board. And when I say irreal, I mean irreal by orthodox standards."

"But the practical application!"

"A gas engine could give us the initial power, or simple nervous energy would do as well. There are vast sources of energy all around us, Mr. Cameron. In a world of orthodox logic we can't tap that energy, or we can't do it without specialized machines, anyhow."

"You've got the *complete* equation? That missing factor—"

"I found it. It fits. We've got something even the Falangists don't have. But even so it isn't unlimited. The variable-truth microcontinuum can be maintained only as long as there's a sufficient energy output effectively tapped and directed. Which may be lucky, or the universe could go hog-wild. There *are* limitations. Even mental radiations can't be maintained indefinitely. But a thought can start the ball rolling."

DuBrose came into Cameron's office.

"Pastor's dead," he said flatly. "Ridgeley killed him. But he didn't use the counterequation."

The director put his hands flat on

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the desk and studied them carefully. A muscle jumped in his cheek.

"That," he said, "is unfortunate."

"How . . . how is it?"

Cameron lifted a ravaged face. "What do you think? They've been hammering at me without a let-up for—a million years! I . . . I . . . give me a shot, Ben."

DuBrose carried a narcotic kit in his pocket these days. He put the sterilized needle deftly into Cameron's arm and let ultraviolet glow briefly on the skin. A moment later the director settled back, the tic in his cheek subsiding.

"Better. Can't stand much of this. Can't think too clearly in this dreamlike state."

"It keeps the bugs away, chief."

"Not bugs now. Something new—" Cameron didn't elucidate. "Tell me—what you want to."

"The scanner's been on Ridgeley, you know. He located Pastor in Dakota ten minutes ago. He sneaked up and killed him with that little crystal gadget of his. Indian stuff. Pastor never saw him coming. Ridgeley crawled to within range and let go. I don't think any civilized man of this time could have done it."

"Ridgeley—trained for war. All kinds."

"Yeah. Well, he didn't have to use the counterequation. The whole thing was recorded; Wood's looking at the play-back now. But I'm sure he won't find anything."

Cameron slowly indicated a paper on his desk. "Been psyching Ridgeley. Read it." He settled back, closing his eyes, the lines of strain still twisting his face. DuBrose studied the director anxiously, knowing that Cameron couldn't stand much more of this. From the moment the doorknob had opened a blue eye and stared at Cameron, the man had been under relentless attack for nearly two weeks. The anxiety neurosis was building up to a true psychosis. Yet if the pressure could be removed, the cure would be speedy.

By the time Eli Wood appeared, DuBrose had finished the paper. He handed it silently to the mathematician.

Wood read it. He nodded at Cameron.

"Doped up, eh? Well, I guess you need it. Ridgeley didn't use the counterequation; did DuBrose tell you?"

"Even if he had," Cameron said rather thickly, "we might not have been able to break it down."

Wood shook his head. "Fallacious logic. We've got the original solved equation as a model now. And it's possible to analyze anything. Just let Ridgeley try that counterequation where I can see him, and I'll guarantee to give you the answer within a few hours, probably. The Integrators are already readjusted for variable logic."

"He might . . . not know it, after all."

DuBrose picked up the paper again. "But he might, chief. If we could force him into a position where he *had* to use it . . . mm-m. What dope have we got on him, anyway?"

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"He came from . . . a world geared to total warfare."

Wood said, "Did you get all that stuff from your mutant?"

DuBrose smiled faintly. "By major operations. This data has been boiled down from eighty thousand words of extraneous material. But as for Ridgeley—we've learned some of his limitations. He's the last of the worriors."

Not quite as simple as that. Picture a world geared to absolute warfare, a world so technologically advanced that interdoctrination could begin before birth. And visualize the planet shaking beneath the conflict of two nations, two races, that had been locked in a death-struggle for generation upon generation. By comparison the war with the Falangists seemed brief.

The matrix was war. That was the basic pattern, and all else had to integrate and co-ordinate. The psychology was more easily understandable than the science of that time.

Indoctrination, then, until the individual was a perfect machine for fighting and winning. But only that.

Necessarily the faculty for compromise, for flexibility, had been rigidly trained along certain military lines. Daniel Ridgeley, since his embryonic period, had been shaped to conquer and rule. Even before his conception, the basic genes and chromosomes had been carefully chosen for heredity value.

And Ridgeley's nation had lost the war.

Of the defeated, many died, and very many more submitted and were absorbed into the social scheme of the victors. But Ridgeley was a war criminal. Not a major one; when he disappeared, no one troubled to search through time for him. He was gone—*and he could not come back*—so he was forgotten.

Temporal travel was beginning to be understood in Ridgeley's period. So he had taken that way of escape. He could not have stayed in his own time-world, because his psychological pattern could not conceivably have fitted into a scheme of failure. He was a machine built for one purpose.

Tigers by heredity and environment are carnivores. On a diet of grass they would die. If they possessed the delicate nervous organisms of men, they might go mad.

Carnivores rule; herbivores submit. The meat of battle—successful war—was necessary to Ridgeley's existence. So, deprived of his natural diet, he had sought it elsewhere.

"Some of this is theoretical," Cameron said slowly.

DuBrose nodded at Wood. "We don't know from how far in the future Ridgeley comes. You'd think he could have referred to a history book and found out whether or not the Falangists will win this war. He'd never choose the losing side."

"Maybe he didn't," Cameron said.

"We worked out another answer, chief. Remember? Histories of this era may not have survived in

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Ridgeley's time. Perhaps all he had to work on was the knowledge that there *was* a war around this period. Then, again, time may be flexible after all, so the future can be changed by switching off into different probability lines. But I dunno. The big thing—" He watched Wood. "Listen to this. Time travel was understood by Ridgeley's nation, and a number of people had tried it then. But none of them ever came back, from either the future or the past."

The mathematician blinked. "Why not?"

"We don't know, yet. Don't forget, our mutant contact is technically insane. He's temporarily disoriented, which is enough to drive anybody batty, I'd say. Those creatures that lived in the Duds might have been able to use ETP and stay sane—but they weren't even remotely human, so normal standards of sanity can't be applied to them. When Billy matured and acquired ETP, he went crazy."

Cameron said, "Can anybody—use the equation?"

"Under guidance, yes," Wood told him. "And it'll be easier as soon as my gadgets are finished."

Cameron closed his eyes. "Deadlock now. We've solved the equation but so have the Falangists. If we get the counterequation, Ridgeley might give it to the Falangists—and it'd be deadlock again. Ben, we'd better mobilize. Get ready for an all-out attack on the Falangists. See Kalender. Is Ridgeley still scanned?"

"Yes."

On the desk Cameron's hands tightened into fists. "Use the equation on him. Hammer him. Give him the same treatment the Falangists are giving me. But worse. An assault that will tie his nerves into bowknots. Don't let up for a second."

Something crawled down DuBrose's spine and exploded into elation. *"Force him to use the counterequation?"*

"In self-protection. It won't be easy. He's resourceful. But there's only one shield against the equation, and if we can drive Ridgeley into using it—"

"O.K., chief. Can do, Wood?"

"Can do," the mathematician said laconically. "But—"

"But what?"

"God help Ridgeley."

XIII.

"Ready?"

"Ready."

The copter was over a mile away. But he could reach it. That was the first step. The second would be to reach the Falangists. With the equation, it should be simple to pass the coastal force-shields. Gray mists of dawn hung over the wheat fields. A few stars faded before the encroaching, pearly light. Under his feet the ground winced and screamed like living flesh.

He blocked his mind.

Concentrate on the single purpose; that was it. Ten minutes to the copter, moving fast. That wouldn't end it. Under his hands

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the controls might squirm and twist; the variable truths, controlled now by his enemies, could hammer relentlessly at him.

But not effectively.

In his own time-era he had been trained to meet such assaults. Usually they were easy to neutralize with the counterequation—which was so simple. He couldn't use it now. There were scanners on him, and avid eyes watching, ready to study and analyze.

Reach the Falangists and give *them* the counterequation. They wouldn't be too grateful, probably, but he could protect himself. And he would be one of the conquerors.

Drops of oily, thick liquid crept down his face and crawled toward his mouth and nostrils. He exhaled more strongly. He kept his mind blocked. Expecting the unexpected was the way to fight such an assault as this. And years of indoctrination and training had showed him the way.

He adjusted his pace as the ground changed its texture, now rough as broken rock, now slick as smooth ice.

The wheat fields sank. He stood on a pinnacle at the edge of an abyss.

He began to descend, iron face impassive, the exultant glow of excitement burning behind the black eyes. He was trained for battle. This was war. Only in the face of dangerous odds could he feel this blazing delight.

His mind had been trained to react unusually to adrenalin. He

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could feel caution, but fear was usually alien to him.

The ground billowed like an ocean.

It slid away from under him. He had been walking for more than ten minutes. The copter was nowhere in sight, nor the grove of trees that sheltered it.

He paused to consider, still keeping that tight rein on his mind. The block held. The invasion glanced off harmlessly.

The landscape had shifted. The copter was over toward the left. He walked in that direction, a sturdy, neckless man trudging through wheat fields—

His eyes shot out on stalks.

"No luck yet."
"Let me try."

The eyes retracted. Before him stretched a Gargantuan chessboard. He felt a compulsion to move toward one square, but he did not turn from his course. The copter—

Here came the chessmen, bizarre, fantastic shapes, leaping in crazy patterns skyward and down again. But he had seen stranger creatures in the bio-labs of his own time-era.

He walked on.

"Three hours, Wood! But at least we've kept him away from his copter."

"He can cope with the imaginations of normal minds, apparently. He's been conditioned—"

"How about psychotic patients? Could you guide their thoughts—project them?"

"It might work. You'll have to help me. Hypnosis, and suggestion. You handle the patients, I'll handle the equation. We'll try it, DuBrose. Can't we get Cameron to help?"

"He's asleep. Drugged. I had to."

Hiding around nonexistent corners the shapes of terror gibbered at him. The slow nightmare flight of white birds painfully labored past. A melting face repeated meaningless rhymed phrases. Red and yellow and spotted imps told him he was guilty and had sinned.

Hallucinations of insane minds, given objective reality by the variability of truth. The properties of energy and matter were altered, on the fairy chessboard, so that these arbitrary chessmen assumed form and substance.

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The fairy chessmen screamed at him, laughed at him, sobbed and whistled and clicked and gasped—

Lurking, hating shadows. The phantoms of irrational fear and hatred and elation. The world of the insane.

He went on toward the copter. His eyes flamed with their terrible, burning delight.

Seven hours.

"I've got one answer," Wood said.

DuBrose turned a white, strained face and mopped sweat from his forehead. "To what?"

"Time travel, I think. Had you realized that Ridgeley could have escaped very easily simply by moving a few days away in time? But he hasn't done that. I've been tying it in with other factors; the fact that in Ridgeley's period nobody ever returned from a temporal trip. And the Duds, too. Our tentative theory about them is that they came back through time searching for something—we'll probably never know what. And they gave up and died right here."

DuBrose kindled a cigarette, noticing that his hand shook uncontrollably. "What does that add up to?"

"One-way time travel," Wood said. He screwed up his face and studied the air. "I've only worked it out in my head, but it adds up. You can move in only one direction temporally. Into the future or the past. But you can't come back."

"Why not?" . . . .

Wood gestured. "Why wasn't Ridgeley pursued by his enemies? He's a war criminal in his own period. But he was allowed to escape through time, and he's extremely dangerous. Suppose he'd gone onto the future, far in advance of his own time, picked up some super-weapons, and returned to his period with them? You don't let a criminal run loose if he has access to a vibropistol."

"Unless he can't *get* back," DuBrose said, frowning. "You mean Ridgeley's exiled?"

"Voluntarily. The creatures in the Duds couldn't retrace their steps either. You can move—and continue to move—in only one temporal direction, either future or past. But you can't return. You'd meet yourself coming back."

"What?"

"It's a one-way track," Wood said. "Two objects can't exist in the same space-time."

"You mean two objects can't occupy the same space at the same time."

"Well? An extension of Ridgeley exists from now to his own period, along the time-line. He can't go home. He'd bump into himself. He'd explode or something."

DuBrose scowled. "Uh. It's a bit hard to swallow. The Duds—"

"They gave up, I suppose. They knew it was no use searching further. So they—died."

"Wait a minute. Why hasn't Ridgeley tried to escape our attack by going into the past? He could do that, couldn't he?"

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"He could, but would he? You're the psychologist."

"Yeah . . . he wouldn't. He can't give up a fight until he knows he's licked. Suppose he decides he *is* licked and escapes into the past again? Without using the counter-equation?"

"Would he? Even if he has to let that information fall into our hands, he's not lost his private war. He may have other aces up his sleeve."

"We've got to break him down. He's resisted all our assaults so far. He's conditioned to the unexpected or something. Even those projections of objective insanity haven't cracked him. What would?"

The mathematician grimaced. "I don't know. If we keep pounding at him—"

A vagrant thought moved through DuBrose's mind. He caught at it.

"The mutant . . . yeah! Billy Van Ness! Wood, could we use him against Ridgeley?"

"Why—how? We're using psychotic projections now."

"Ordinary insanity," DuBrose said quickly, stubbing out his cigarette. "Van Ness has got something special. ETP. He's a mutation of a nonhuman race, a totally alien one. They gave him a legacy that drove him insane as soon as he could use it. The extratemporal perception was latent in him till he matured. Then—retreat to insanity. I don't think even Ridgeley's mind could stand ETP.

"We don't want to drive him insane."

"Don't forget his trigger responses. He'll know what we're trying to do. He'll use the counter-equation—he'll have to. There won't be time for him to work out other possible solutions. If the ETP is as dangerous as I think it is, Ridgeley will get one whiff of it, panic, and give us the information we want. But—can we transmit Van Ness' ETP?"

"Not according to orthodox logic," Wood said. "Only we'll use a truth-variant in which psychic transmission of the faculty is possible. We can try it."

"If it works, we'll have to be ready." DuBrose spoke into a visor. "Instant mobilization. At the word, smash down on the Falangists with the equation applications we've already charted. Get me Kalender . . . Mr. Secretary? Hold ready. The word may come at any time now. An all-out robot assault on the Falangists."

"We're mobilized for that," Kalender said tautly. "What about defense?"

"When we get the counterequation, we can handle it from here. Wood and his staff will tackle it instantly. O.K.?" DuBrose turned from the visor, a tight, cold feeling in his stomach.

He was afraid of what he was going to do.

They kept up the unrelenting attack on Ridgeley as they prepared. But the courier, by sheer, dogged nerve—or lack of it—had nearly reached his copter. As Wood rechecked and diagramed the factors of the equation that they would

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have to use, DuBrose put the mutant under hypnosis and made sure that the warped, half-alien mind was sufficiently under his control.

The scanner showed Ridgeley trudging on, his eyes blazing with the joy of conflict that was his reason for being, while around him the materialized madness of variable truths raged unceasingly.

To render Ridgeley en rapport with Billy Van Ness—that was the plan. If it could be done—

Finally:

"Ready, DuBrose?"

"Ready."

This was the lance that could pierce his armor. He saw it coming. In that single moment while Ridgeley saw and understood what weapon they were using against him, he analyzed the chances, made his decision, and acted.

He used the counterequation.

Around him the turmoil died. The wheat fields lay placid under the afternoon sun. A hundred feet away was the grove of trees that shielded the copter.

He was armored now. The equation could not harm him. But his enemies had forced him to reveal the nature of the counterequation. Very well. He could still fly to the Falangists—

Luckily he had protected himself before there had been full rapport with that mutant. Even the brief glimpse he had had was disturbing, a small, latent seed buried deep in his brain.

A seed?

Latent?

But what was this thing that grew, that uncoiled, that spiraled out and out through his consciousness as though a spark had ignited the whole heap of gunpowder? One cell in his brain, one thought—but from that thought the contagion leaped faster than light, giving Ridgeley the extra-temporal preception that had come from an alien race of the ultimate future.

Delayed reaction. Time-bomb. The brain-colloid had to adjust itself to ETP—

The grove of trees was in violent movement. No, that was illusionary. There were hundreds, thousands of trees, superimposed in space but conjoining in time, and the line of their duration stretched like a network, with offshoots of germination that ended in other trees—

Masonry loomed before Ridgeley.

Tepees stood there.

Future and past—

Limited spatially to this area, but without temporal limits. Everything that had been or was to be, Ridgeley perceived in a shifting, monstrous kaleidoscope that became clearer as his perception sharpened. It was not merely sight. ETP is something else, a consciousness of the objective that goes beyond vision and sound and hearing.

Spatially the manifestation was limited to a small area immediately surrounding Ridgeley, but he was oddly certain that he could expand the range at will. He made no effort to do that. He stood motionless, his head sunk between his

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heavy shoulders, veins throbbing on his forehead.

Suddenly he closed his eyes.

The disorientation grew worse. A dozen, a hundred, a thousand material objects occupied the same space in which he existed. An illusion. But he knew that two objects cannot concomitantly occupy the same space-time.

In the past and future, at this spot, there had been catastrophes. The land-surface of the earth is not large. And, in all time, there had been opportunity for lightning to strike near here, for quakes to rock the ground and for trees to crash down on the spot where Ridgeley stood.

The veins throbbed faster on his forehead. Teeth clenched, he bowed his head as though fighting a storm of sleet, while the ETP natural to a nonhuman race channeled through his brain, opening unimaginable doors.

Van Ness and the other mutants had learned to perceive duration—and they had gone mad. Disorientation was terribly inevitable. Only by retreating into insanity had they been able to survive at all, in a world of complete flux, of utter incoherence to any mind that instinctively expected a logical pattern. This was not even variable truth. It was fairy chess with a board extended to the end and the beginning of time, and on that incalculably vast chessboard the innumerable pieces were moving. . . .

A player can see the board and the pieces and comprehend the pattern. But if a pawn—or, in fairy chess, a nightrider—could see the board from the viewpoint of a player—what would be his reaction?

Ridgeley drew in upon himself, tighter and tighter. The impingement was becoming unendurable.

His legs bent. He sank down.

Keeping his eyes squeezed shut, he drew up his knees, crossed his clenched fists, and bent his head forward. He remained motionless in the foetal position.

He was not dead. He breathed.

But that was all.

A month later Cameron sat at his desk and stared defeat in the face. Not national defeat. Victory was three weeks old already, but how ephemeral a victory only Cameron knew.

The long, routine years had been merely preparation; the attack, invasion and conquest of the Falangists had been blitz. The counterequation was a sword that nothing could turn. Or rather, a shield the enemy did not possess. Under Eli Wood's direction the disorganization of the Falangists had progressed with unbelievable speed.

And here was peace.

Everywhere but in this room, this head, this foreboding mind. The counterequation was s i m p l e to apply, and Cameron still kept its effect in use around him. He had a reason. He was still shaky from his long ordeal, but no variable-truths could penetrate the armor of the counterequation even if any fugitive Falangists were still able to operate from hiding. Cameron was safe from that.

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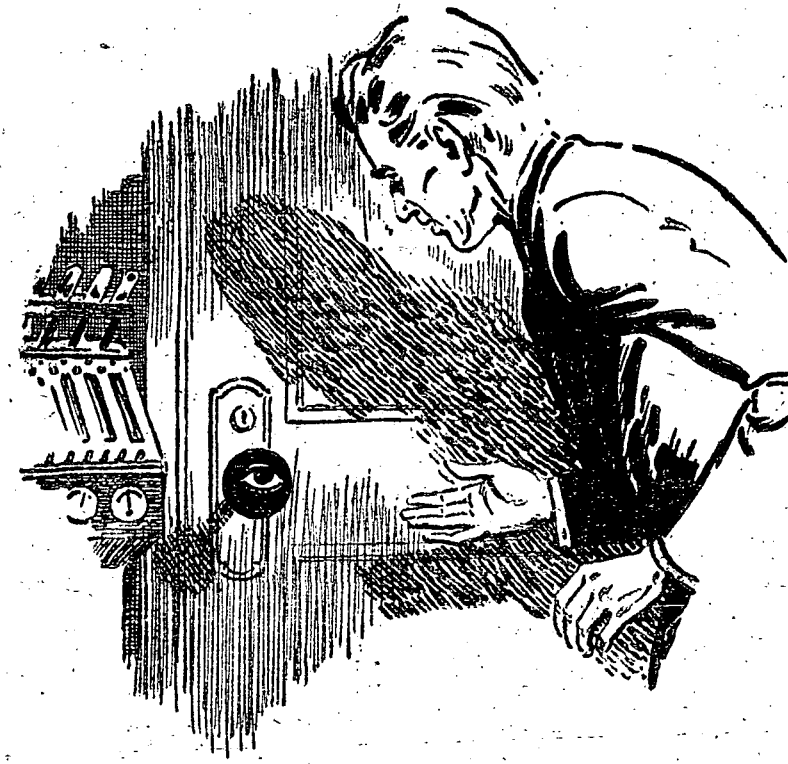

From himself he was not safe. He sat quite still, his back to the door, and a conversation from a few days past drifted through his mind. He did not want to remember it, but the sentences beat inexorably in his ears.

DuBrose: "Here's some indoctrination stuff for the Falangists. Needs your O.K., chief."

Cameron: "I'll tend to it. How do you feel, Ben? Want a furlough?"

DuBrose: "Lord, no. The work's too fascinating. Even Ridgeley—though, of course, he's incurable. And a good thing."

Cameron: "Good? Well, necessary. But not just, Ben."

DuBrose: "Not just? For my money, it was a beautiful case of applied justice. He started this mess through time-traveling, and ETP smashed him."

Cameron: "You think Ridgeley started it? He didn't. His psychological pattern was set long before his birth, before his conception. He acted in the only way he possibly could have acted. You can't hold a man responsible for the things that happened before he was born. The real culprits were the ones who made Ridgeley's indoctrination

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along those lines necessary—and possible. Do you know who those culprits were, Ben?"

DuBrose had looked bewildered. "Who?"

Cameron tapped the papers on his desk. "What's this stuff? Indoctrination plans. We've got to use them. We've got to train our own men along supervised military lines or the Falangists may start another war. Preparedness is necessary. A vital survival-factor. But in the end—Ben, the end of it will be Ridgeley. Ridgeley's civilization. The seeds of that culture are right here, in these papers, in us, and what led to us out of our own past. We're the culprits, Ben."

"Casuistry," DuBrose had said.

"Yes, maybe. Anyhow, it's got to be done."

"Don't think about it," DuBrose advised. "That's one responsibility you can't change. You aren't responsible for what happened in your past any more than Ridgeley was for his. Forget it."

"Yes, but you see, I *know*. The men who evolved our work for us and taught us didn't know. They hadn't seen what I've seen—the ultimate end. But when you *know*, and can't do anything but go right on with a thing whose end you've seen already—when you see a war fought and men going mad and men dying and Ridgeley punished as he was punished for a thing that can be traced straight back to me—*that* responsibility's hard to take, Ben."

He had struck his desk a hard blow, and had time for a brief flash of irrelevant pleasure in the knowledge that it must remain a solid desk now the counterequation was on. Not a surface that would ripple under the blow, or open a wet mouth to engulf his fist.

DuBrose had said, "You need a furlough worse than I do. I'm going to see you get one."

Cameron went to a window port, opened it and watched the red gloom of the thundering Spaces outside. There was no escape. Every other nation was a potential enemy. From California to the Eastern Seaboard the nation had to remain a perfect war machine, ready to move into action at a second's notice. In such a machine, men are important cogs. And they must be cast of the right alloy, shaped to the right measure with precision skill, polished and tooled until they were—

Till they were men like Ridgeley.

And Cameron dared not change that process. He dared not even try, for fear of succeeding. What could he say? "Disarm. Seek peace. Hammer your swords into ploughshares."

And suppose they did? The enemy would strike again—and succeed, against an unprepared nation.

The thundering Spaces were before him, but all he saw was a race of circling thoughts made all but visible in the limbo of his mind.

"Forget it," he said aloud.

But there must be an answer.

"Forget it."

No problem is insoluble. There must be an answer.

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"I've tried to find it for weeks. There is no answer. Forget it."

There must be an answer. You're responsible. You created Ridgeley.

"Not I alone."

But you have the knowledge the others don't have. You're responsible.

"Forget it."

Tell them? Don't tell them? There must be an answer.

"This has been going on for weeks. The war's over—"

This war. You're responsible.

"Forget it. I'm going home. I'm going to take a furlough. I'm going to take Nela. We'll go up into the woods and relax."

There must be an answer.

"So there'll be future wars. I . . . . I'm no idealist. What can I do? Ridgeley's civilization—it's not pleasant. It may end in extinction, or a race of semirobots. Or the race may achieve peace finally."

But you're responsible. You can't dodge that. You made Ridgeley. What can you do?

"I . . . there must be an answer."

There must be an answer.

"There must be an answer."

There must be an answer!

THERE MUST BE AN ANSWER!

THERE MUST BE AN ANSWER THERE MUST BE AN ANSWER THERE MUST BE—

DuBrose got into the pneumocar, adjusted the straps, and waited for the blankout. After it had passed, he settled back to fifteen minutes of idleness as the vehicle rushed toward Low Chicago. But his mind was active.

The past month had changed Ben DuBrose. He looked older than his thirty years now, perhaps because his blue eyes had acquired a new look of competence and his mouth was firmer. Seth Pell's death had left him as potential successor to the job of Director of Psychometrics, and a crown prince is usually conscious of his responsibilities. Always before, DuBrose had known that Cameron and Pell were, in effect, buffers. He was Number Three—not quite a third leg, but certainly a spare tire. Now, however, Pell was dead, and Cameron had shown that he was not infallible. Some day the big job would devolve upon DuBrose, and he would be ready for it. Far more ready than he had been a month ago.

He had changed. His horizons had expanded. Eli Wood's conversation had done a good deal in that direction, and so had the very concept of variable logic. He was older, abler, and even wiser. He could see, for example, why the war-time precautions had not been relaxed. The Falangists were defeated, but the location of Low Chicago and the other war-cities was still in the realm of military secrecy.

Preparedness was necessary, of course. Yet DuBrose thought that there would not be another war. He thought of the stars. And he thought of the mutant Van Ness, and of Ridgeley.

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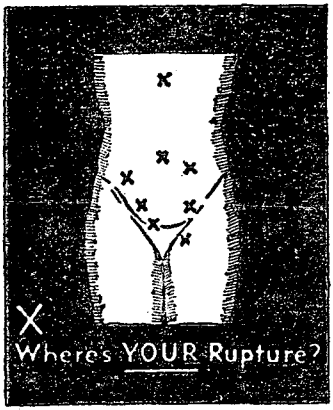

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In Daniel Ridgeley's time there had been no interplanetary travel. There had been only global conflict that stretched back for unknown years, back along a time-track of conquest and defeat and deadlock, wars of attrition and red triumph and ash-tray failure, back to the war between America and the Falangists, and even before that. It was one road, the road that led to Ridgeley and his tremendous, futile culture.

One road out of many. No wonder, DuBrose pondered, that Ridgeley had chosen the wrong side when he came back through time. Had he thought that the Falangists were the ultimate victors? Or had he—not known?

Say he had not known. Or, if he had, he might have felt that his technological gifts could swing the balance in the direction he chose.

But there was another answer. Ridgeley's movement through time and his subsequent actions had affected time itself. Had switched the pattern of the future into a new path. Variable futures—

Again DuBrose remembered the mutant, and what Van Ness had revealed about that tremendous world that was now never to exist. For it was a world founded upon war, upon centuries and ages of continual battle, while the seesaw of victory swayed back and forth between the nations. War brings about technological progress, but only in certain specialized directions. Rocket-fuel, solar mirrors in super-atmospheric orbits, antigravity may be perfected for use, somehow, against the enemy, but not for use against the stars.

In Eden, DuBrose thought, leaning back against the softly padded cushions—in Eden the trouble began. And even after that, Cain slew Abel. In every Paradise, there have been wars. But in the Polar cold, in the Sahara, in all inhospitable lands where men wrench a dangerous living from the hostile elements, there is comradeship and unity against the Enemy older than man, the universe in which he dwells.

And now? The earth was at peace, for a little while. The weapons, the fuels, the technological miracles the world had perfected for destruction lay idle—and such things could not remain unused. Not while the stars hung in the skies, and the planets held their secrets—no longer unreachably far away. During the war no interplanetary travel had been attempted. The all-out effort had prevented such frivolous experiments.

But now the tools lay ready. Nations geared to the highest pitch of efficiency could not remain idle, could not rust in a lethargy that would be psychologically unendurable. There would always be an Enemy.

Not the Falangists. The Enemy stood at the gates of the sky, with the silent challenge it had given since man first raised his eyes from the ground. There would be new ships, DuBrose thought, a singing, joyous excitement in his blood—

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new ships like this pneumocar, but not burrowing through the dirt like moles. Ships to reach the planets.

There was the Enemy. The hostile universe that had always made man band together in a common unity. There lay the future that would wipe out Ridgeley's futile, tragic culture—because the future would slip into a new track now, one that led to solar—galactic!—expansion rather than fatal interglobal conflict.

A thousand years might pass. Ten thousand. But even then, Ridgeley would never be born. The arid soil from which his culture sprang had been fertilized, enriched by a nutrient that would bring forth greater glories than Ridgeley had ever imagined.

For years man had had the bridge. But now he could use it. Now he could reach the stars.

They were the Enemy. The hostile, distant, alluring, secret stars. And they, too, would be conquered. But that would be no sterile victory.

DuBrose thought: *The old order changeth, giving place to new.*

The pneumocar stopped. DuBrose stepped out into Low Chicago. "I must tell the chief," he thought, as he moved toward a Way, and then—"Oh, well. He's probably figured it out for himself already."

But the chief had not figured it out. He could not, now. For Robert Cameron had been fighting too long, and his battle had been waged with the resources of pure nerve. When tremendous tension is relaxed suddenly, the result is sometimes dangerous.

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The chief was very vulnerable now.

Vulnerable to phantoms.

—THERE MUST BE AN ANSWER THERE MUST BE AN ANSWER THERE MUST—

Stop it.

He didn't want to stop. Even in that circling confusion was refuge of a sort, from this unbearable responsibility which was in itself a grim kind of justice. The guilty must be punished. He himself must be punished. He, Cameron, a war criminal beside whom Ridgeley was as innocent as a tank or a plane. He must go on. Answer or no, he must go on. His duty was to the living, not the unborn future.

Was it? Was it? He had not asked for this responsibility. But ignorance of the law excuses no man. Justice . . . Justice . . . If thine eye offend thee—

If thine eye offend thee—

Yes, there was one answer. Not a good one, but an answer. He had only to turn around to accept it. He decided to turn around.

Automatically his hand reached out to close the window port. It did not shrink away from his touch. The metal remained firm and cool, as metal should. The counterequation still held him cradled in an unbroken shell of protection from all enemies. He knew that. No variable-truths could reach him here even if any enemies survived to hurl them at him.

He was shut in here with the one inescapable enemy.

He knew what was behind him. He had felt it a little while ago when he reached unsuspectingly for the door. There had been a strange, soft fluttering against his palm as he touched the knob. He had not looked down then. He had jerked his hand away and gone back to the desk. Now he would face it. Now he would look, and know, and accept the answer that would mean his own personal release, a laying down of the burden he had not asked for and could no longer carry. Now he would face the door.

The doorknob opened a blue eye and looked at him.

THE END.

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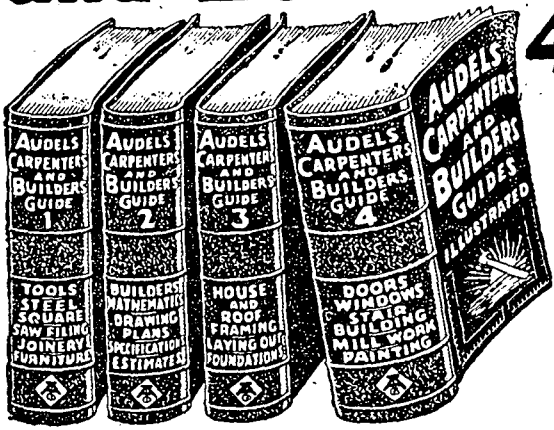

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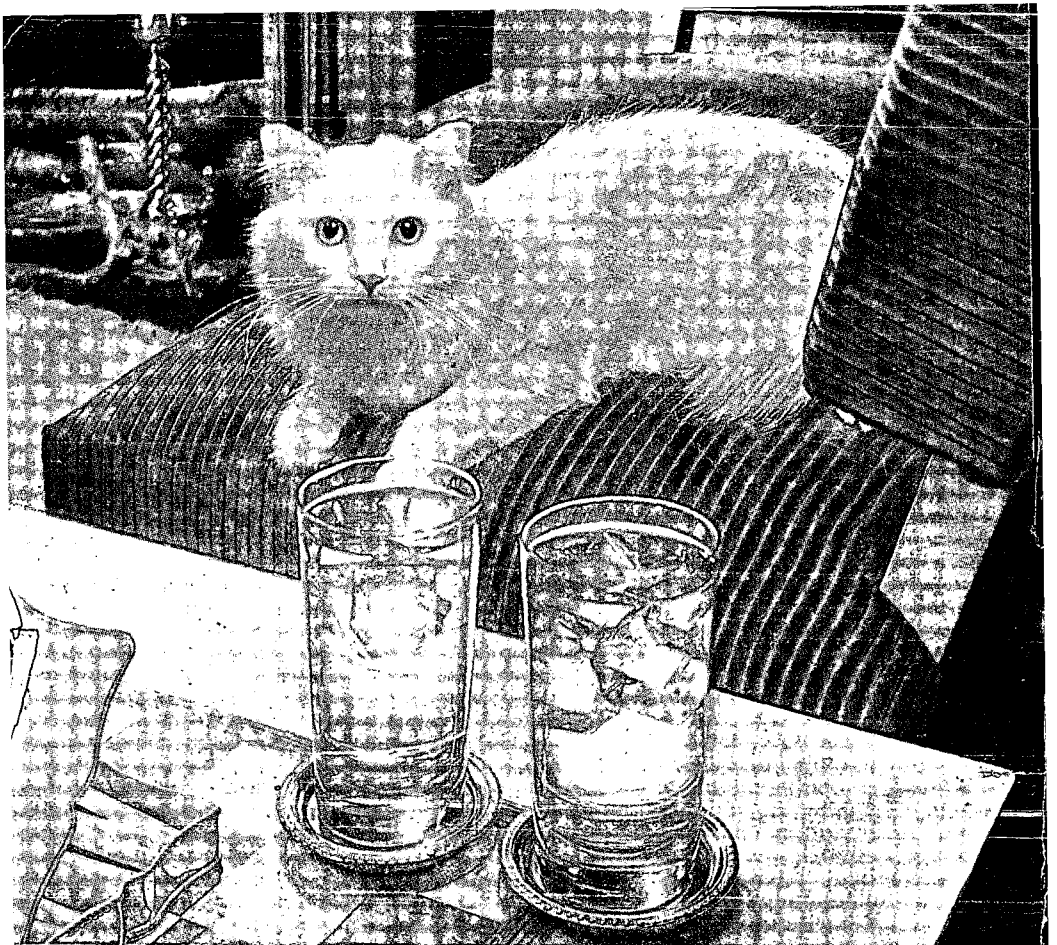

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